

OLD 407 BASKET: JOB 362
206L BASKET: JOB 492/493

Box For PACKING - Shippers Supply
56

AUX LATCH FOR FRONT END

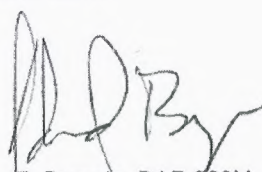
RALPH'S ARCTIC CAT / YAMAHA #5 2220-32 AVE N.E.

0115-306 LATCH CORD

291-4868

0115-307 HOOD LATCH. CUP

FORM AE-100

DEPARTMENT OF TRANSPORT STATEMENT OF COMPLIANCE OF AIRCRAFT OR AIRCRAFT COMPONENTS WITH THE AIRWORTHINESS REQUIREMENTS		AE-100 No.: AE606-1 Initial Issue Date: 1 February, 2005 Revision: 0 Revision Date: Approval No.: SH00-48 Delegation No.: 290M Delegate Name: E. Burgoin Classification of Designee: Employer: AERO Design Ltd.		
Aircraft Mfr: Bell Aircraft Model: 206L Series, 407 Registration: All Eligible		Model Type Airplane <input type="checkbox"/> Helicopter <input checked="" type="checkbox"/> Appliance <input type="checkbox"/> Component <input type="checkbox"/>		
LIST OF APPROVED REPORTS AND DATA				
Document Number		Document Title	Compliance Status	
DCL606-1	Revision 0	Document Control List and all documents referred to therein		
ER606.01	Revision 0	Engineering Report		
ER606.02	Revision 0	Test Report		
ER606.03	Revision 0	Engineering Report		
TR606.04	Revision 0	Test Report		
TR606.05	Revision 0	Test Report		
ER492.01	Revision 0	Engineering Report		
ER492.02	Revision 0	Test Report		
ER493.01	Revision 0	Engineering Report		
ER493.03	Revision 0	Test Report		
ER362.02	Revision 0	Test Report		
60602	Revision 0	External Attachment Provisions Installation		
60603	Revision 0	Cargo Basket Installation		
60620	Revision 0	Block Fabrication		
60621	Revision 0	Forward Fitting Fabrication		
60622	Revision 0	Barrel Nut Fabrication		
60624	Revision 0	Barrel Nut Fabrication		
60630	Revision 0	Cargo Basket Assembly		
60631	Revision 0	Cargo Basket Body		
60632	Revision 0	Cargo Basket Lid		
60640	Revision 0	Basket Components - Rim		
60641	Revision 0	Basket Components - End Hoop Assembly		
60642	Revision 0	Basket Components - Attachment Hoop Assembly		
60643	Revision 0	Basket Components - Spine		
60644	Revision 0	Basket Components - Lug		
DATA APPROVED BY TRANSPORT CANADA				
FMS606.01	Revision 1	Flight Manual Supplement		
MI606.01	Revision 2	Maintenance Instructions		
CERTIFICATION UNDER THE AUTHORITY VESTED IN ME BY THE DEPARTMENT OF TRANSPORT, I HEREBY CERTIFY THAT THE DATA LISTED ABOVE AND ON THE ATTACHED SHEETS NUMBERED 2 HAVE BEEN EXAMINED IN ACCORDANCE WITH ESTABLISHED PROCEDURES AND FOUND TO COMPLY, TO THE BEST OF MY KNOWLEDGE AND BELIEF WITH THE PERTINENT COMPLIANCE REQUIRMENTS. I THEREFORE <input type="checkbox"/> RECOMMEND FOR APPROVAL OF THESE DATA <input checked="" type="checkbox"/> APPROVE THESE DATA  E. Burgoin, DAR 290M				

FORM AE-100

LIST OF APPROVED REPORTS AND DATA			
Document Number		Document Title	Compliance Status
60646	Revision 0	Basket Components - Mounting Plate	
60647	Revision 0	Basket Components - Bushing	
60648	Revision 0	Basket Components - Hoop	
60649	Revision 0	Basket Components - Step Brace	
49212	Revision 0	Basket Components - Rim	
49213	Revision 1	Basket Components - Lid Brace	
49215	Revision 0	Basket Components - Lug	
49216	Revision 0	Basket Components - Lug	
49218	Revision 0	Placard	
49221	Revision 2	Support Beams	
36255	Revision 1	Handle Assembly	
36261	Revision 1	Handle Bar Assembly	
36262	Revision 1	Handle Bracket Assembly	
36271	Revision 0	Handle Lever	
36272	Revision 0	Basket Bracket	
36273	Revision 0	Lid Bracket	
36274	Revision 0	Bushing	
36275	Revision 1	Bushing	
36276	Revision 0	Spring Hook	
36277	Revision 0	Handle Bar	
36278	Revision 1	Spring	
36280, Sht. 1/2	Revision 2	Brace	
36280, Sht. 1/2	Revision 2	Brace	

FORM AE-100

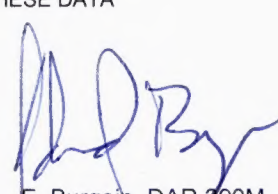
DEPARTMENT OF TRANSPORT STATEMENT OF COMPLIANCE OF AIRCRAFT OR AIRCRAFT COMPONENTS WITH THE AIRWORTHINESS REQUIREMENTS		AE-100 No.: AE606-1 Initial Issue Date: 1 February, 2005 Revision: 0 Revision Date: Approval No.: SH00-48 Delegation No.: 290M Delegate Name: E. Burgoin Classification of Designee: Employer: AERO Design Ltd.
Aircraft Mfr: Bell Aircraft Model: 206L Series, 407 Registration: All Eligible	Model Type Airplane <input type="checkbox"/> Helicopter <input checked="" type="checkbox"/> Appliance <input type="checkbox"/> Component <input type="checkbox"/>	

LIST OF APPROVED REPORTS AND DATA		
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ER606.02	Revision 0 Test Report	
ER606.03	Revision 0 Engineering Report	
TR606.04	Revision 0 Test Report	
TR606.05	Revision 0 Test Report	
ER492.01	Revision 0 Engineering Report	
ER492.02	Revision 0 Test Report	
ER493.01	Revision 0 Engineering Report	
ER493.03	Revision 0 Test Report	
ER362.02	Revision 0 Test Report	
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60644	Revision 0 Basket Components - Lug	
DATA APPROVED BY TRANSPORT CANADA		
FMS606.01	Revision 1 Flight Manual Supplement	
MI606.01	Revision 2 Maintenance Instructions	

CERTIFICATION

UNDER THE AUTHORITY VESTED IN ME BY THE DEPARTMENT OF TRANSPORT, I HEREBY CERTIFY THAT THE DATA LISTED ABOVE AND ON THE ATTACHED SHEETS NUMBERED 2 HAVE BEEN EXAMINED IN ACCORDANCE WITH ESTABLISHED PROCEDURES AND FOUND TO COMPLY, TO THE BEST OF MY KNOWLEDGE AND BELIEF WITH THE PERTINENT COMPLIANCE REQUIREMENTS.

I THEREFORE ☐ RECOMMEND FOR APPROVAL OF THESE DATA
☒ APPROVE THESE DATA


 E. Burgoin, DAR 290M

FORM AE-100

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36277	Revision 0	Handle Bar	
36278	Revision 1	Spring	
36280, Sht. 1/2	Revision 2	Brace	
36280, Sht. 1/2	Revision 2	Brace	



EXPRESS

GROUND
TERRESTRE DATE

MO. D.-J. Y.-A.

04/20/2004

L-708081460

FROM/DE
AERO DESIGN LTD.
2013 39th Ave NE
CALGARY ABPREPAID
PORT PAYE

TO/A

E+B HELICOPTERS
2595 ISLAND HWY
CAMPBELL RIVER BC
HOLD FOR PICK UPCOLLECT
PORT DU

POSTAL CODE/CODE POSTAL

T2E6R7

POSTAL CODE/CODE POSTAL

V9W6Y4

SHIPPER ACCOUNT NO.
N° DE COMPTE DE L'EXPÉDITEUR

TELEPHONE:

4032508027

RECEIVER ACCOUNT NO.
N° DE COMPTE DU DESTINATAIRE

TELEPHONE:

250874421

INST. NS

REFERENCE

LB ☒ WEIGHT / POIDSIN ☒ PO

DIMENSIONS

CORRECTED WEIGHT/POIDS RÉVISÉ

CORRECTED DIMENSIONS / DIMENSIONS RÉVISÉES

KG ☒CM ☒

7.5 X 7.2 X 24 1.8



1-800-CALL-DHL

www.dhl.com

SHIPPERS VALUE PROTECTION

IF SHIPPERS VALUE PROTECTION OF \$100 (FOR WHICH A \$3.00 VALUATION CHARGE IS APPLIED) IS NOT WANTED, WRITE NIL.

PROTECTION DE LA VALEUR DE L'EXPÉDITEUR
SI LA PROTECTION DE LA VALEUR DE L'EXPÉDITEUR DE 100 \$ (À LAQUELLE S'APPLIQUE UNE TAXATION À LA VALEUR DE 3 \$) N'EST PAS DEMANDÉE, ÉCRIRE NIÉANT DANS CETTE CASE.

SPECIAL AGREEMENT #

ENTENTE SPECIALE

EMP.

PICK-UP / CUEILLETTE

TIME/HEURE

☒NO DELIVERY SIGNATURE REQUIRED
SIGNATURE NON REQUISE À LA LIVRAISON

X

SEE TERMS AND CONDITIONS ON REVERSE
VOIR LES TERMES ET CONDITIONS AU VERSO

IMPORTANT - READ CAREFULLY / IMPORTANT - À LIRE ATTENTIVEMENT

GUARANTEED DELIVERY TIMES FOR DHL EXPRESS 9 A.M. EXPRESS SERVICE ONLY SEE CONDITION 8 ON REVERSE

MAXIMUM LIABILITY \$2,000/L.B. (\$4.41 KG.) OR SHIPPERS VALUE PROTECTION. SPECIAL AGREEMENT REQUIRED FOR SHIPPERS VALUE PROTECTION OVER \$1,000.00. SEE CONDITION 2 ON REVERSE

DANGEROUS GOODS RESTRICTIONS (read condition 3 on reverse).

HEURE DE LIVRAISON GARANTIE UNIQUEMENT POUR SERVICE DHL EXPRESS 9 A.M.

VOIR CONDITION 8 AU VERSO

RESPONSABILITE MAXIMUM 2,000 \$/L.B. (4,41 \$/KG.) ou PROTECTION DE LA VALEUR DE L'EXPÉDITEUR. ENTENTE SPECIALE REQUISE SI PLUS DE 1,000.00 \$ DE PROTECTION DE LA VALEUR DE L'EXPÉDITEUR

VOIR CONDITION 2 AU VERSO

RESTRICTIONS POUR LES MATIÈRES DANGEREUSES (lisez condition 3 au verso).

SPECIAL PRODUCTS
PRODUITS SPECIAUX9 A.M. EXPRESS
EXPRESS 9 A.M.

FRAGILE

SATURDAY DEL.
LIV. SAMEDIRETURN CHEQUE
CHÈQUE RETOURNÉDANGEROUS GOODS
MATIÈRES DANGEREUSESRESIDENTIAL
RESIDENTIELSHIPMENT INFORMATION
DETAIL DE L'EXPÉDITIONENVELOPE
ENVELOPPEPACK
POCHETTEPARCEL
COLIS

PIECES

1

FREIGHT \$ / \$ EXP.

GST/TPS 1220B 2753 RT0002

TOTAL \$ / \$ MONTANT

SHIPPER
EXPÉDITEURFOR SHIPMENTS WITHIN CANADA ONLY
POUR LES EXPÉDITIONS À L'INTÉRIEUR DU CANADA SEULEMENT

SENDER ACCOUNT NO. N° DE COMPTE DE L'EXPÉDITEUR 4367155		IMPORTANT - TÉLÉPHONE (403) 250 8027	
SENDER (FROM) / EXPÉDITEUR (DE) AERO DESIGN		MO DY/JR/YR/AN 02/02/07	
STREET ADDRESS / ADRESSE (N° ET RUE) 2013 39 AVE NE			
CITY / VILLE CALGARY		PROV./STATE/ÉTAT ALTA	POSTAL / ZIP T2E 6R7
RECEIVER (TO) / DESTINATAIRE (À) E & B HELICOPTERS LTD.			
STREET ADDRESS / ADRESSE (N° ET RUE) 2595 ISLAND HIGHWAY			
CITY / VILLE CAMPBELL RIVER BC		PROV./STATE/ÉTAT	POSTAL / ZIP V9W 6Y4
ATTN: (NAME / DEPT.) / À L'ATTENTION DE (NOM / SERVICE) ED WILCOCK		IMPORTANT - TÉLÉPHONE (250) 282 4421	
DESCRIPTION (INCLUDING DANGEROUS GOODS / INCLUANT MARCHANDISES DANGEREUSES) FITTINGS			
SENDER REFERENCE (IF ANY) / REF. DE L'EXPÉD.		PICK UP / BUEILLETTE - N° DE CONF. 6994-1351	
		0008	

SENDER SIGNATURE / SIGNATURE DE L'EXPÉDITEUR

X SEE CONDITIONS OF CARRIAGE ON REVERSE / CONDITIONS DE TRANSPORT AU VERSO X

SHIP MODE / MODE DE TRANSPORT			
AIR AÉRIEN		GROUND ROUTIER <input checked="" type="checkbox"/>	
PKG / EMBAL.		SERVICE	
1 TYPE ONLY TYPE SEULEMENT CHOOSE CHOISIR	PUR-O- LETTER	1 PIECE ONLY PIECE SEULEMENT	9 AM 9 h
	PUR-O- PAK		10:30 AM 10 h 30
	OTHER AUTRE		SAT. SAM.
	PAYMENT / PAIEMENT		
CASH COMPTANT		CREDIT CARD CARTE DE CRÉDIT	
RECEIVER OR THIRD PARTY ACCOUNT NO. / N° DE COMPTE DU DESTINATAIRE OU TIERS			
RECEIVER DESTINA- TAIRE		3RD PARTY TIERS	
SENDER EXPÉDITEUR			
SHIPMENT / DETAILS / EXPÉDITION			
#/Nbre PCS (4 MAXIMUM)	WEIGHT / POIDS SUBJ. TO CORR. / SUJET À CORR.		
1	KG	LB 10	
DECLARED VALUE / VALEUR DÉCLARÉE (SURCHARGE APPLIES OVER \$100) (SUPPLÉMENT AU-DESSUS DE 100 \$)			
\$		\$5,000 MAX. MAX 5 000 \$	
SEE CONDITIONS OF CARRIAGE ON REVERSE / CONDITIONS DE TRANSPORT AU VERSO			

BILL OF LADING NO.
NOT NEGOTIABLE
N° DE CONNAISSANCE
NON NEGOCIABLE

2747 320 1575



1 888 SHIP-123 • www.purolator.com

COURIER INITIALS INITIALES DU COURRIER	COURIER ROUTE ITINÉRAIRE DU COURRIER	MO DY/JR YR/AN 25
NO./N° TYPE <input type="checkbox"/> VISA <input type="checkbox"/> MC <input type="checkbox"/> AMEX		EXP. DATE D'EXP.

RECEIVER OR THIRD PARTY ACCOUNT NO. / N° DE COMPTE DU DESTINATAIRE OU TIERS	CHARGES FRAIS
	TOTAL AMOUNT / MONTANT TOTAL
THIRD PARTY BILLING NAME & ADDRESS / FACTURATION À UN TIERS (NOM & ADRESSE)	

LIMITATION OF LIABILITY - IMPORTANT - PLEASE READ:
THE AMOUNT OF ANY LOSS OR DAMAGE FOR WHICH THE CARRIER MAY BE LIABLE SHALL NOT EXCEED \$2.00 PER POUND (OR \$4.41 PER KILOGRAM) COMPUTED ON THE TOTAL WEIGHT OF THE SHIPMENT UNLESS A HIGHER VALUE IS DECLARED ON THE FACE OF THE BILL OF LADING BY THE CONSIGNOR (SENDER). MAXIMUM DECLARED VALUE SHALL NOT EXCEED \$5,000. N.B. NOTE CAREFULLY CONDITIONS ON BACK HEREOF INCLUDING LIMITATIONS AND EXCLUSIONS OF CARRIER'S LIABILITY, WHICH ARE HEREBY ACCEPTED.

LIMITATION DE RESPONSABILITÉ - IMPORTANT - LISEZ S.V.P.
LE MONTANT DE TOUTE Perte OU DOMMAGE DONT LE TRANSPORTEUR POURRAIT ÊTRE RESPONSABLE NE DOIT PAS EXCÉDER 2,00 \$ LA LIVRE (OU 4,41 \$ LE KILOGRAMME), CALCULÉ SUR LE POIDS TOTAL DE L'EXPÉDITION, À MOINS QU'UNE VALEUR SUPÉRIEURE N'AIT ÉTÉ DÉCLARÉE SUR LE RECTO DU CONNAISSANCE PAR L'EXPÉDITEUR. LA VALEUR DÉCLARÉE MAXIMALE NE DÉPASSERA PAS 5 000 \$. N.B. VEUILLEZ PRENDRE CONNAISSANCE DES CONDITIONS AU VERSO, Y COMPRIS LES LIMITATIONS ET EXCLUSIONS DE RESPONSABILITÉ DU TRANSPORTEUR, QUI SONT ACCEPTÉES PAR LES PRÉSENTES.

PLEASE REFER TO BILL OF LADING NUMBER FOR SHIPMENT STATUS / INQUIRIES.
POUR TOUT RENSEIGNEMENT, VEUILLEZ NOUS COMMUNIQUER LE NUMERO DE CONNAISSANCE.

Address:

E & B Helicopters Ltd.
P.O. Box 1000
Campbell River, BC
V9W 6Y4

Attention:

Ed Wilcock

Phone #:

250-287-4421

We hereby declare that the parts supplied herein do conform with the referenced drawings. Use and installation of the parts may require further approval, and shall also comply with applicable airworthiness standards.



Signature

Product: Bell 407 FWD Landing Gear Fittings

Reference: Your Purchase Order #: _____

Documents Included with this Shipment:

Installation Drawing 60602

Parts and Assemblies Included with this Shipment:

Quantity Ordered	Quantity Shipped	Part Number	Description	
2	2	60621-01	Forward Landing Gear Fittings	✓

Address:

E & B Helicopters Ltd.
P.O. Box 1000
Campbell River, BC
V9W 6Y4

Attention:

Ed Wilcock

Phone #:

250-287-4421

We hereby declare that the parts supplied herein do conform with the referenced drawings. Use and installation of the parts may require further approval, and shall also comply with applicable airworthiness standards.

Signature

Product: Robinson R44 Bear Paws

Reference: Your Purchase Order #: _____

Documents Included with this Shipment:

Installation Drawing 64001

Parts and Assemblies Included with this Shipment:

Quantity Ordered	Quantity Shipped	Part Number	Description	✓
2	2	64010-01	Bear Paw Assemblies	
2	2	64021-01	Strap	
4	4	64021-02	FWD Spacer	
4	4	64021-03	AFT Spacer	
4	4	AN4-36A	Bolt	
8	8	AN970-4	Washer	
8	8	AN960-416	Washer	
4	4	MS21044N4	Nut	
2	2	AN3-7A	Bolt	
2	2	AN3-10A	Bolt	
4	4	AN960-10	Washer	
2	2	MS21044N3	Nut	

AERO Design Ltd.
2013 - 39th Ave. NE
Calgary, AB, T2E 6R7

AUTHORIZED RELEASE CERTIFICATE

TRANSPORT CANADA
TCCA 24-0078
AMF # 73-04

Product: FORWARD FITTING Part #: 60621-01

Approval #: SH00-48 Serial #: _____

WO #: 2006-07 Quantity: 2

Eligibility: BELL 407 Work Status: Manufactured

Remarks: _____

I hereby certify that the product identified above has been manufactured in accordance with the applicable design data and the Canadian Aviation Regulations or applicable foreign regulations.

June 6 / 06
Date

Jeff Clarke
Inspector's Signature

AERO Design Ltd.
2013 - 39th Ave. NE
Calgary, AB, T2E 6R7

AUTHORIZED RELEASE CERTIFICATE

TRANSPORT CANADA
TCCA 24-0078
AMF # 73-04

Product: Bear Paw Set (4 Paws, Straps, Hardware) Part #: 64001-01

Approval #: SH05-17 Serial #: N/A

WO #: 2005-09 Quantity: 1

Eligibility: Robinson R44 Work Status: Manufactured

Remarks: _____

I hereby certify that the product identified above has been manufactured in accordance with the applicable design data and the Canadian Aviation Regulations or applicable foreign regulations.

April 17 / 06
Date

Jeff Clarke
Inspector's Signature

DOCUMENT CONTROL LIST

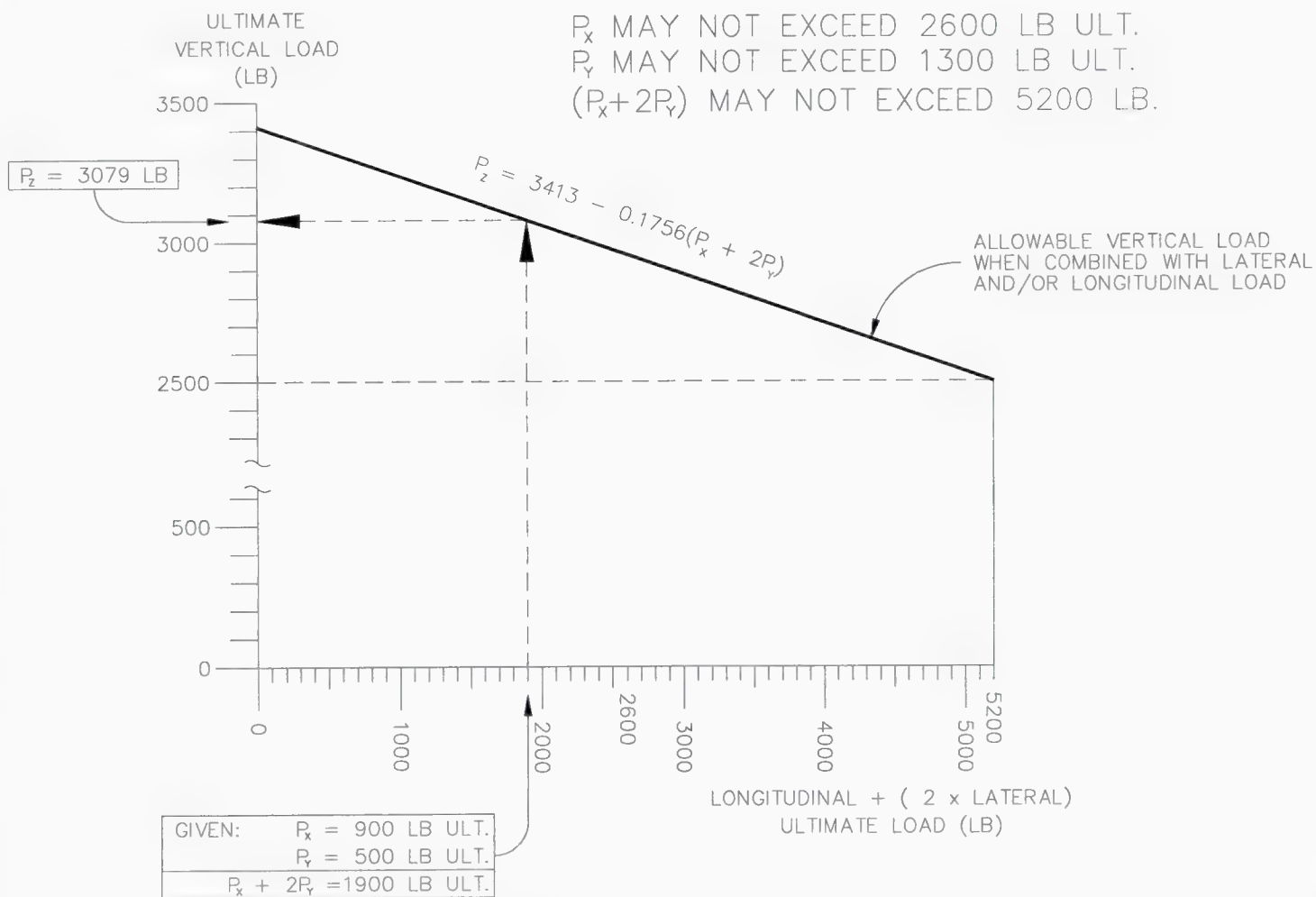
DOCUMENT NO.	DOCUMENT CONTENT	REVISION
FABRICATION DOCUMENTS		
70401	Forward End Modification	0
70402	Lid Door Modification	0
70403	Auxiliary Latch Modification	0
ENGINEERING DOCUMENTS		
ER704.02	Engineering Report	0
<div> <div> <p>APPROVAL:</p>  <p>Transport Canada</p> <p>AIRCRAFT CERTIFICATION DIVISION</p> <p>APPROVED</p> <p>By <u>D.S. Austen</u></p> <p>Appr'l No. <u>SHCO-48</u></p> <p>Appr'l Date <u>00-12-08</u></p> <p>Issue No. <u>5</u></p> <p>Issue Date <u>06-06-09</u></p> <p>YY-MM-DD</p> </div> <div> <p>ORIGINAL DATE:</p> <p>10 May 2006</p> <p>REVISION DATE:</p> </div> <div> <p>AERO DESIGN LTD.</p> <p>2013 – 39th Ave NE, Calgary, Alberta, T2E 6R7</p> <p>Ph. (403) 250-8027</p> <p>Fax. (403) 250-8333</p> </div> </div>		
SHEET 1 OF 1		Cargo Basket Modifications
DCL704		Rev. 0

DOCUMENT CONTROL LIST

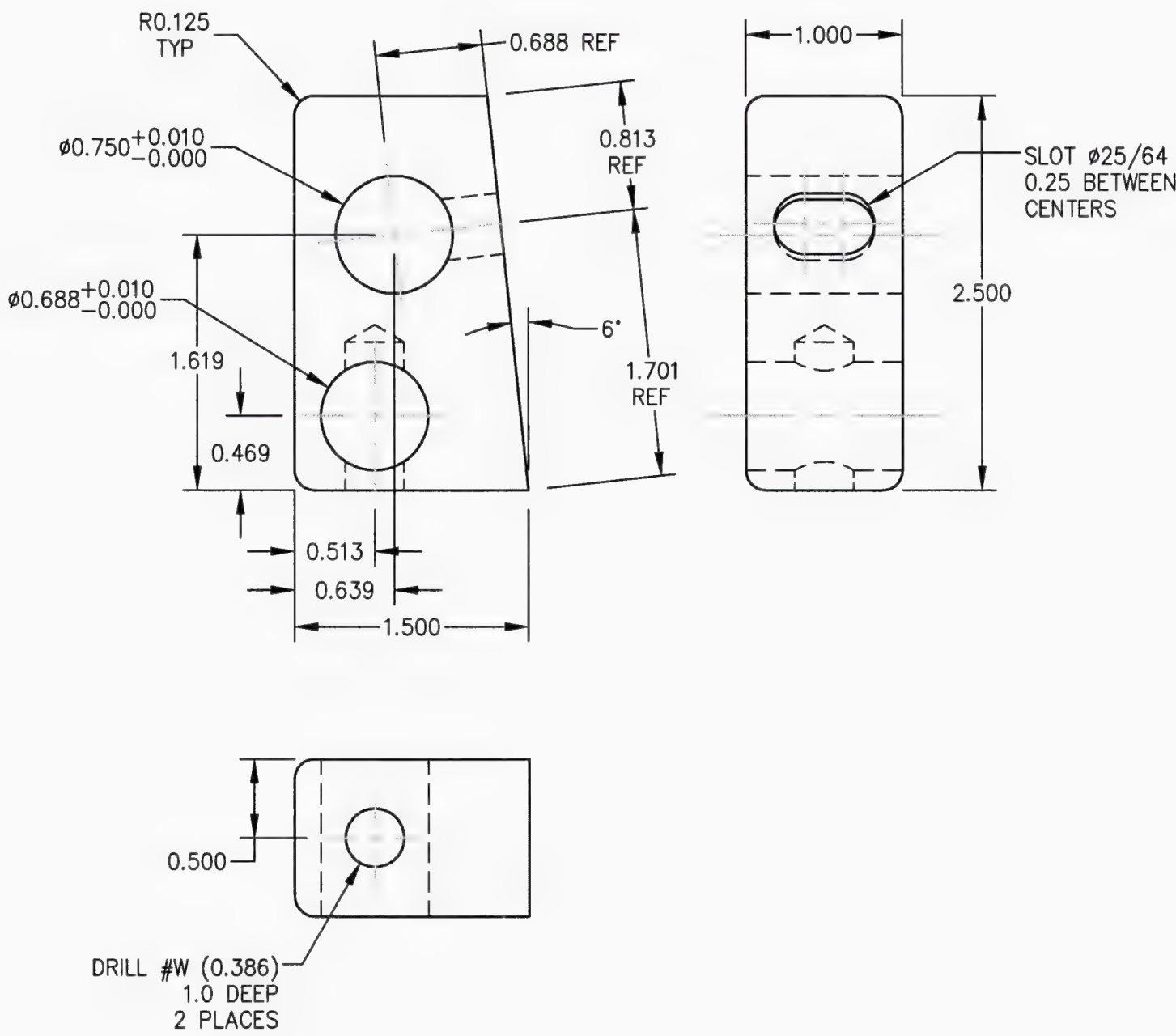
DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
62301	Auxiliary Step Installation	0
FABRICATION DOCUMENTS		
62320	Step Assembly	1
ENGINEERING DOCUMENTS		
ER623.01	Engineering Report	0
APPROVAL:		
<div style="border: 1px solid black; padding: 5px;"> <div style="display: inline-block; text-align: center;"> Transport Canada </div> <div style="display: inline-block; text-align: center;"> Transports Canada </div> </div> <div style="text-align: center; margin-top: 10px;"> AIRCRAFT CERTIFICATION DIVISION APPROVED By <u>D. S. Cluskey</u> Appr'l No. <u>SH00-48</u> Appr'l Date <u>00-12-08</u> Issue No. <u>4</u> Issue Date <u>05-04-14</u> <small>YY-MM-DD</small> </div>	ORIGINAL DATE: 13 January, 2005 REVISION DATE:	<div style="text-align: center;"> AERO DESIGN LTD. 2013 – 39th Ave NE Calgary, Alberta T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333 </div>
	SHEET 1 OF 1	Bell 206L Series and 407 Auxiliary Step Installation
	DCL623		Rev. 0

DESIGN ALLOWABLE ULTIMATE VERTICAL LOAD WHEN COMBINED WITH LONGITUDINAL AND LATERAL LOADS

EXAMPLE: IF A GIVEN INSTALLATION APPLIES 900 LB OF DRAG ULTIMATE LOAD, AND 500 POUNDS OF SIDE ULTIMATE LOAD, THEN UP TO 3079 POUNDS OF VERTICAL ULTIMATE LOAD IS PERMITTED.



THIS DRAWING CONTAINS INFORMATION AND DATA WHICH IS PROPRIETARY TO AERO DESIGN LTD. THIS DRAWING, OR ANY PORTION THEREOF, MAY NOT BE REPRODUCED, COPIED, OR DUPLICATED IN ANY MANNER, NOR USED FOR MANUFACTURING WITHOUT THE WRITTEN CONSENT OF AERO DESIGN LTD. BY ACCEPTING THIS DRAWING FOR REFERENCE, THE RECIPIENT AGREES TO HOLD AERO DESIGN LTD. HARMLESS FROM THE USE, OR MISUSE, OF THIS DRAWING OR THE INFORMATION CONTAINED THEREON.			
REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE	BJC	24 MAR 04



01 BLOCK

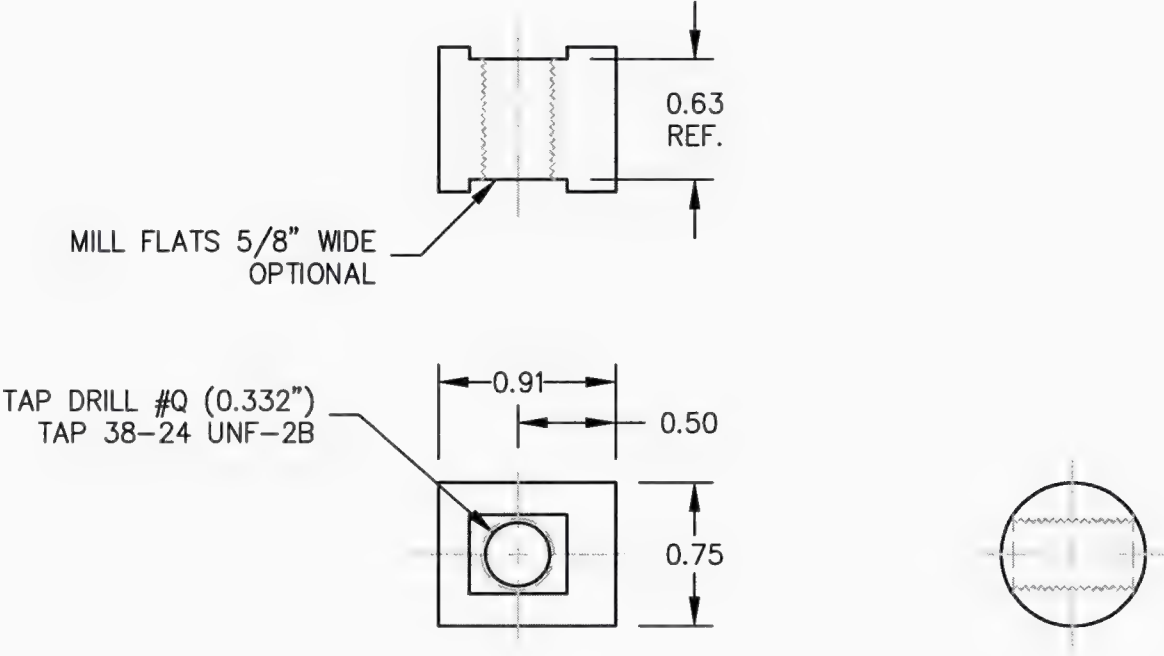
- NOTES:
- 1. REMOVE ALL BURRS AND SHARP EDGES.
 - 2. ALL ALUMINUM PARTS TO BE THOROUGHLY DEGREASED, ALODINED, PRIMED AND PAINTED.

2	60620-01	01	BLOCK	6061-T6 ALUMINUM	QQ-A-200/8	1.0 X 2.5 RECT. BAR
QTY	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE

LIST OF MATERIALS

	APPROVALS		DATE		<div>AERO DESIGN LTD.</div> <div>CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M 2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7 tel: (403) 250-8027 fax: (403) 250-8333 aerodesign@telusplanet.net</div>			
	DRAWN: JEFF CLARKE		24 MAR 2004					
	CHECKED: E. BURGOIN		24 MAR 2004					
	<div>UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2" X.XX ±0.03 X.X ±0.1</div>				<div>BELL 407</div> <div>EXTERNAL ATTACHMENT PROVISIONS</div> <div>BLOCK FABRICATION</div>			
					SCALE 1 : 1		DWG. SIZE	DWG. NO.		REV.
SHEET 1 OF 1		LGL	60620		0			

LIST OF MATERIALS					
PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC.	STOCK SIZE
60622-01	01	BARREL NUT	AISI 304 SS	MIL-S-5059	Ø3/4" BAR



01 BARREL NUT

NOTES:
1. REMOVE ALL BURRS AND SHARP EDGES.

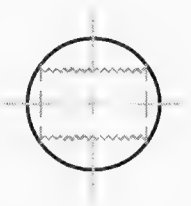
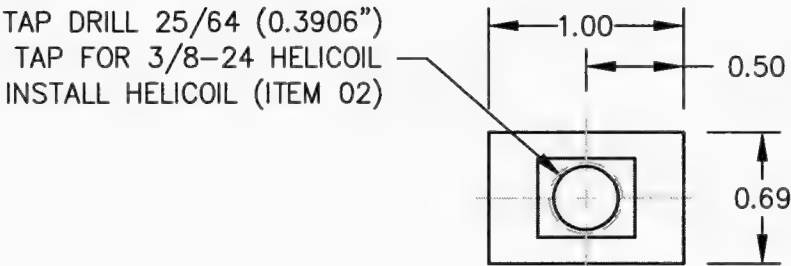
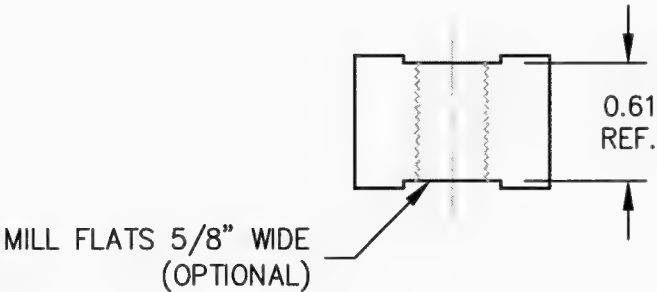
0	CREATED FROM 49320, REV. 1	BJC	MAR 29/04
REV.	DESCRIPTION OF CHANGE	INITIALS	DATE

NOTICE

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APPROVALS		DATE		<div>AERO DESIGN LTD.</div> <div>CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M 2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7 tel: (403) 250-8027 fax: (403) 250-8333 aerodesign@telusplanet.net</div>					
DRAWN: JEFF CLARKE		29 MAR 2004							
CHECKED: E. BURGOIN									
<div>UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2° X.XX ±0.03 X.X ±0.1</div>				BELL 407 EXTERNAL ATTACHMENT PROVISIONS BARREL NUT FABRICATION					
				SCALE 1 : 1		DWG. SIZE	DWG. NO.	REV.	
				SHEET 1 OF 1		A1	60622	0	

LIST OF MATERIALS					
PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC.	STOCK SIZE
60624--01	01	BARREL NUT	AISI 304 SS	MIL-S-5059	Ø11/16" BAR
3591-6CN	02	SELF-LOCKING THREAD INSERT	HELICOIL		3/8-24 UNF x 9/16" LONG



01 BARREL NUT

NOTES:
1. REMOVE ALL BURRS AND SHARP EDGES.

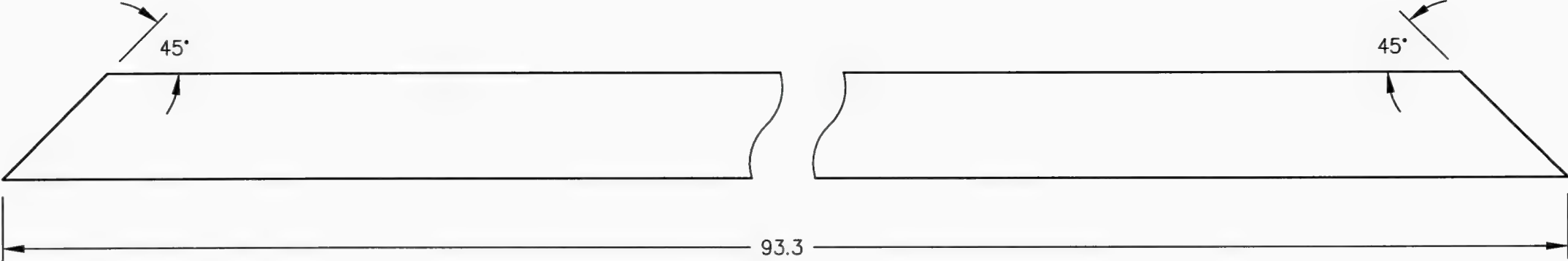
0	CREATED FROM 49320, REV. 1	BJC	MAR 29/04
REV.	DESCRIPTION OF CHANGE	INITIALS	DATE

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APPROVALS		DATE		<div>AERO DESIGN LTD.</div> <div>CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M 2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7 tel: (403) 250-8027 fax: (403) 250-8333 aerodesign@telusplanet.net</div>					
DRAWN: JEFF CLARKE		29 MAR 2004							
CHECKED: E. BURGOIN									
<div>UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2° X.XX ±0.03 X.X ±0.1</div>				BELL 407 EXTERNAL ATTACHMENT PROVISIONS BARREL NUT FABRICATION					
				SCALE 1 : 1		DWG. SIZE	DWG. NO.	REV.	
				SHEET 1 OF 1		A1	60624	0	

LIST OF MATERIALS					
PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC.	STOCK SIZE
60640-01	01	RIM	4130 STEEL COND. N	MIL-T-6736	3/4" SQR x 0.035 WALL



01 RIM

NOTES:
1. REMOVE ALL BURRS AND SHARP EDGES.

1			
REV.	DESCRIPTION OF CHANGE	INITIALS	DATE

NOTICE

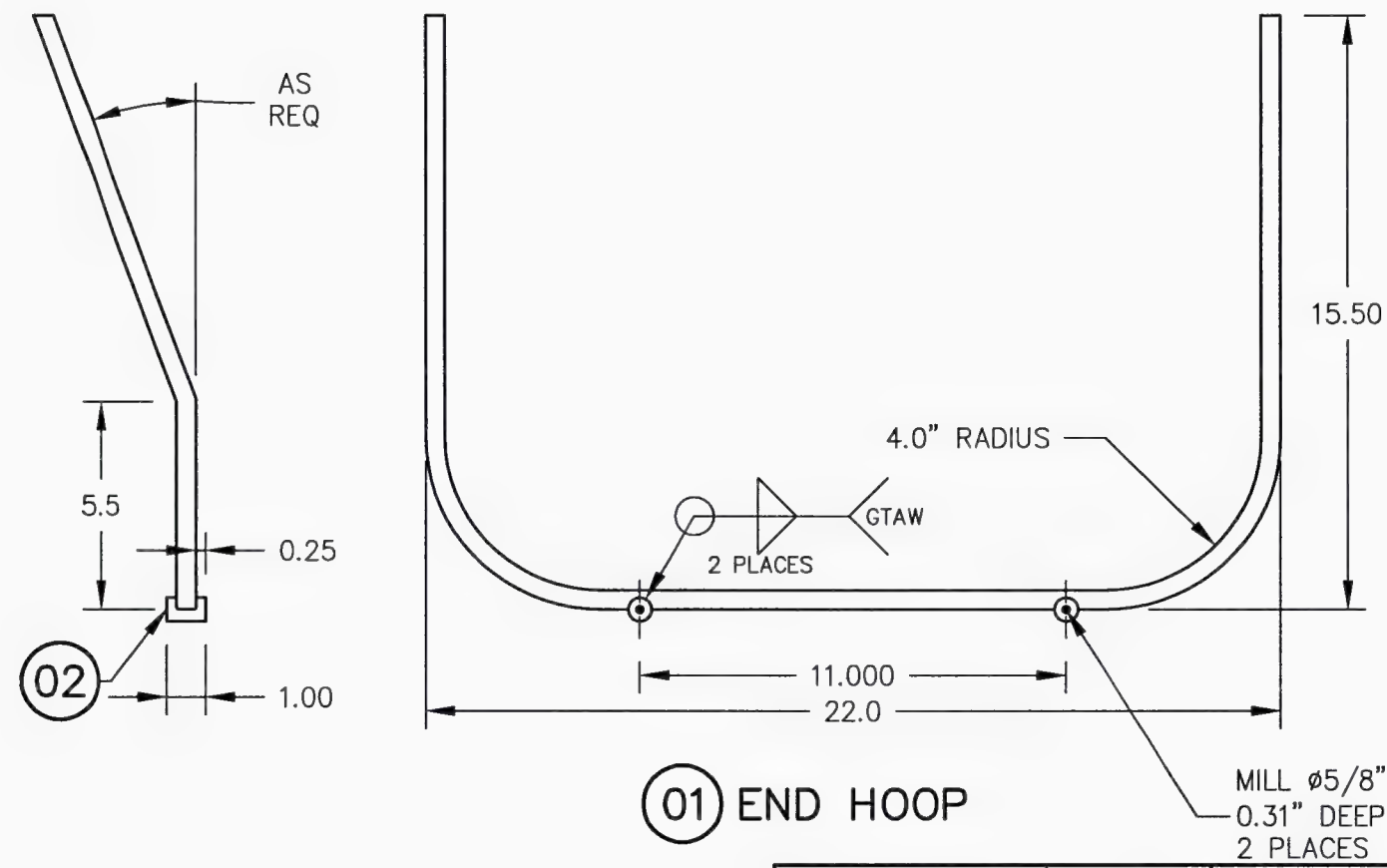
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APPROVALS	DATE
DRAWN: JEFF CLARKE	12 AUG 2004
CHECKED: E. BURGOIN	
STRESS:	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON:	
DECIMALS	ANGLES
X.XXX ±0.010	±1/2°
X.XX ±0.03	
X.X ±0.1	

AERO DESIGN LTD. ENGINEERING CONSULTANTS 1045 McTAVISH ROAD N.E. CALGARY, ALBERTA T2E 7G9			
BELL 407, 206L SERIES HIGH SIDE MOUNTED CARGO BASKET BASKET COMPONENTS – RIM			
SCALE 1 : 1	DWG. SIZE	DWG. NO.	REV.
SHEET 1 OF 1	LGL	60640	0

QTY	LIST OF MATERIALS					
01	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC.	STOCK SIZE
1	60641-01	01	END HOOP	4130 STEEL COND. N	MIL-T-6736	1/2" SQR x 0.035 WALL
2	60644-01	02	LUG	1018 CARBON STEEL	ASTM A108	ø5/8" ROD

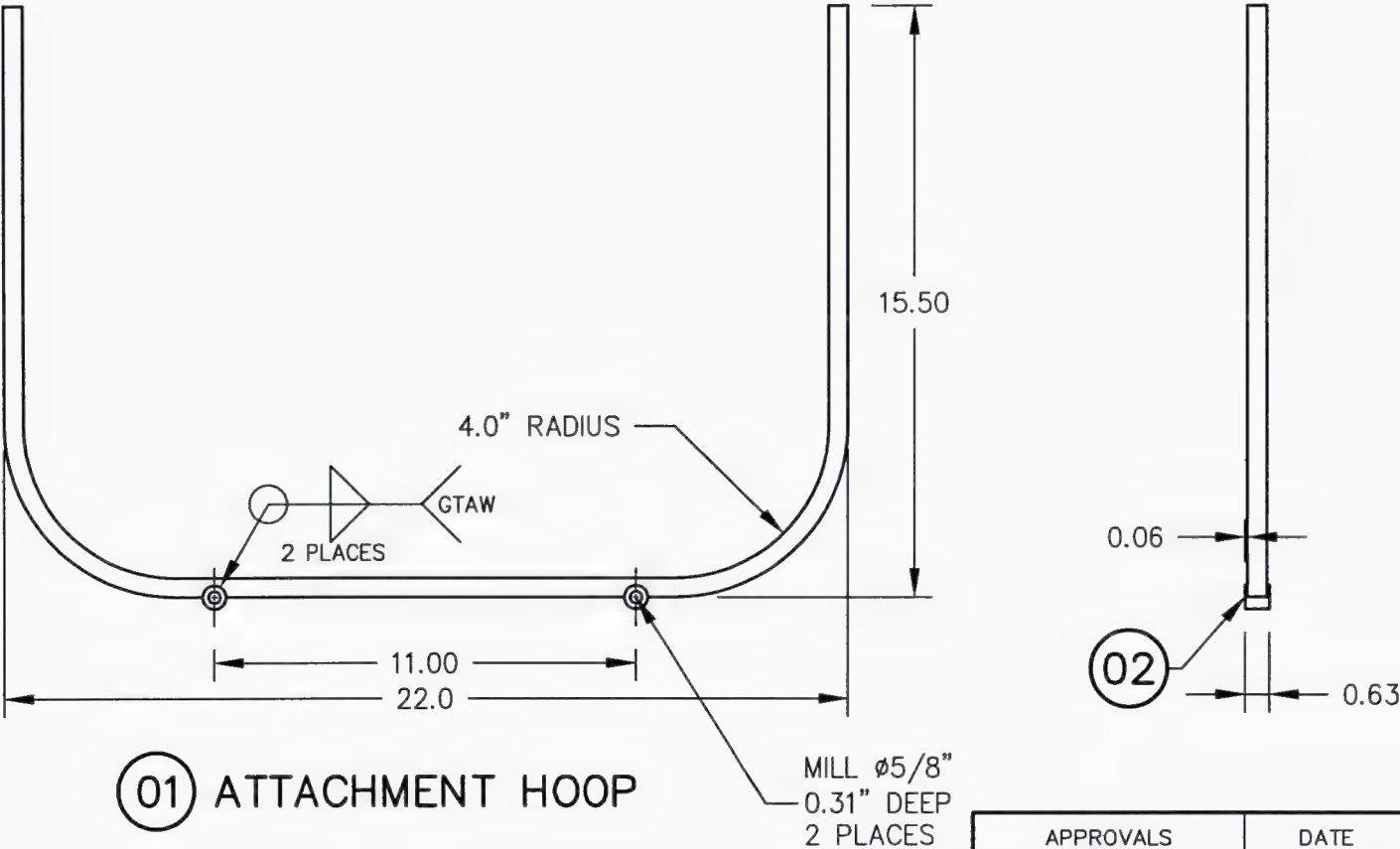


- NOTES:
1. REMOVE ALL BURRS AND SHARP EDGES.
 2. DRILL 3/32" VENT HOLE IN BOTTOM OF HOOP FOR VENTING WELD GASES.

1			
REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
<p align="center">NOTICE</p> <p>THIS DRAWING CONTAINS INFORMATION AND DATA WHICH IS PROPRIETARY TO AERO DESIGN LTD. THIS DRAWING, OR ANY PORTION THEREOF, MAY NOT BE REPRODUCED, COPIED, OR DUPLICATED IN ANY MANNER, NOR USED FOR MANUFACTURING WITHOUT THE WRITTEN CONSENT OF AERO DESIGN LTD. BY ACCEPTING THIS DRAWING FOR REFERENCE, THE RECIPIENT AGREES TO HOLD AERO DESIGN LTD. HARMLESS FROM THE USE, OR MISUSE, OF THIS DRAWING OR THE INFORMATION CONTAINED THEREON.</p>			

APPROVALS	DATE	<p align="center">AERO DESIGN LTD.</p> <p>CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M 2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7 tel: (403) 250-8027 fax: (403) 250-8333 aerodesign@telusplanet.net</p>			
DRAWN: JEFF CLARKE	12 AUG 2004				
CHECKED: E. BURGOIN					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2° X.XX ±0.03 X.X ±0.1		BELL 407 AND 206L SERIES HIGH SIDE MOUNTED CARGO BASKET BASKET COMPONENTS - END HOOP			
SCALE 1 : 5		DWG. SIZE	DWG. NO.	REV.	
SHEET 1 OF 1		A1	60641	0	

QTY	LIST OF MATERIALS					
	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC.	STOCK SIZE
01	60642-01	01	ATTACHMENT HOOP	4130 STEEL COND. N	MIL-T-6736	1/2" SQR x 0.035 WALL
2	60644-02	02	LUG	1018 CARBON STEEL	ASTM A108	ø1/2" ROD

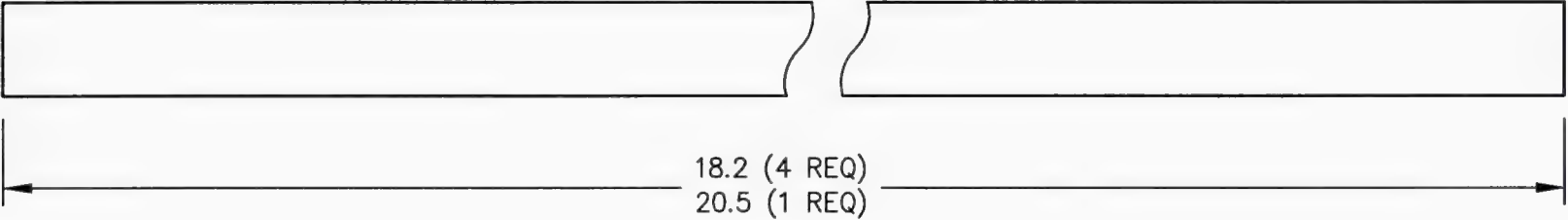


- NOTES:
1. REMOVE ALL BURRS AND SHARP EDGES.
 2. DRILL 3/32" VENT HOLE IN BOTTOM OF HOOP FOR VENTING WELD GASES.

1			
REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
<p align="center">NOTICE</p> <p>THIS DRAWING CONTAINS INFORMATION AND DATA WHICH IS PROPRIETARY TO AERO DESIGN LTD. THIS DRAWING, OR ANY PORTION THEREOF, MAY NOT BE REPRODUCED, COPIED, OR DUPLICATED IN ANY MANNER, NOR USED FOR MANUFACTURING WITHOUT THE WRITTEN CONSENT OF AERO DESIGN LTD. BY ACCEPTING THIS DRAWING FOR REFERENCE, THE RECIPIENT AGREES TO HOLD AERO DESIGN LTD. HARMLESS FROM THE USE, OR MISUSE, OF THIS DRAWING OR THE INFORMATION CONTAINED THEREON.</p>			

APPROVALS	DATE	AERO DESIGN LTD.			
DRAWN: JEFF CLARKE	12 AUG 2004	CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M			
CHECKED: E. BURGOIN		2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7			
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON:		BELL 407 AND 206L SERIES HIGH SIDE MOUNTED CARGO BASKET BASKET COMPONENTS – ATTACHMENT HOOP			
DECIMALS ANGLES		SCALE 1 : 5	DWG. SIZE	DWG. NO.	REV.
X.XXX ±0.010 ±1/2"					
X.XX ±0.03					
X.X ±0.1					
SHEET 1 OF 1		A1	60642	0	

LIST OF MATERIALS					
PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC.	STOCK SIZE
60643-01	01	SPINE	4130 STEEL COND. N	MIL-T-6736	1/2" SQR x 0.035" WALL



01 SPINE

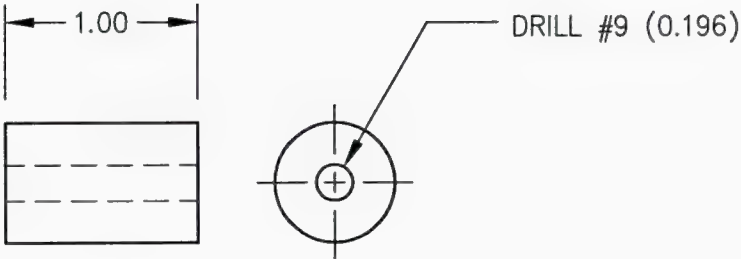
- NOTES:
1. REMOVE ALL BURRS AND SHARP EDGES.
 2. DRILL 3/32" VENT HOLE NEAR END FOR VENTING WELD GASES.

1			
REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
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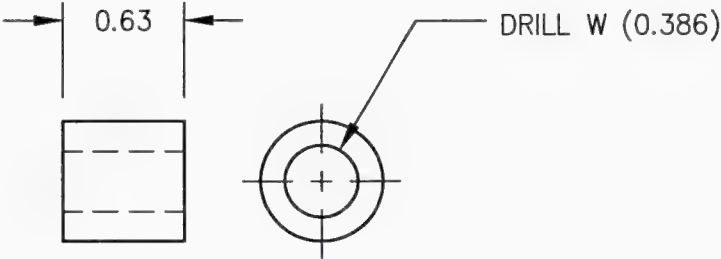
APPROVALS		DATE		AERO DESIGN LTD. ENGINEERING CONSULTANTS 1045 McTAVISH ROAD N.E. CALGARY, ALBERTA T2E 7G9					
DRAWN: JEFF CLARKE		12 AUG 2004							
CHECKED: E. BURGOIN									
STRESS:									
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON: DECIMALS X.XXX ±0.010 X.XX ±0.03 X.X ±0.1 ANGLES ±1/2°				BELL 407, 206L SEREIS HIGH SIDE MOUNTED CARGO BASKET BASKET COMPONENTS – SPINE					
				SCALE 1 : 1		DWG. SIZE	DWG. NO.	REV.	
				SHEET 1 OF 1		LGL	60643	0	

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REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE		



01 LUG



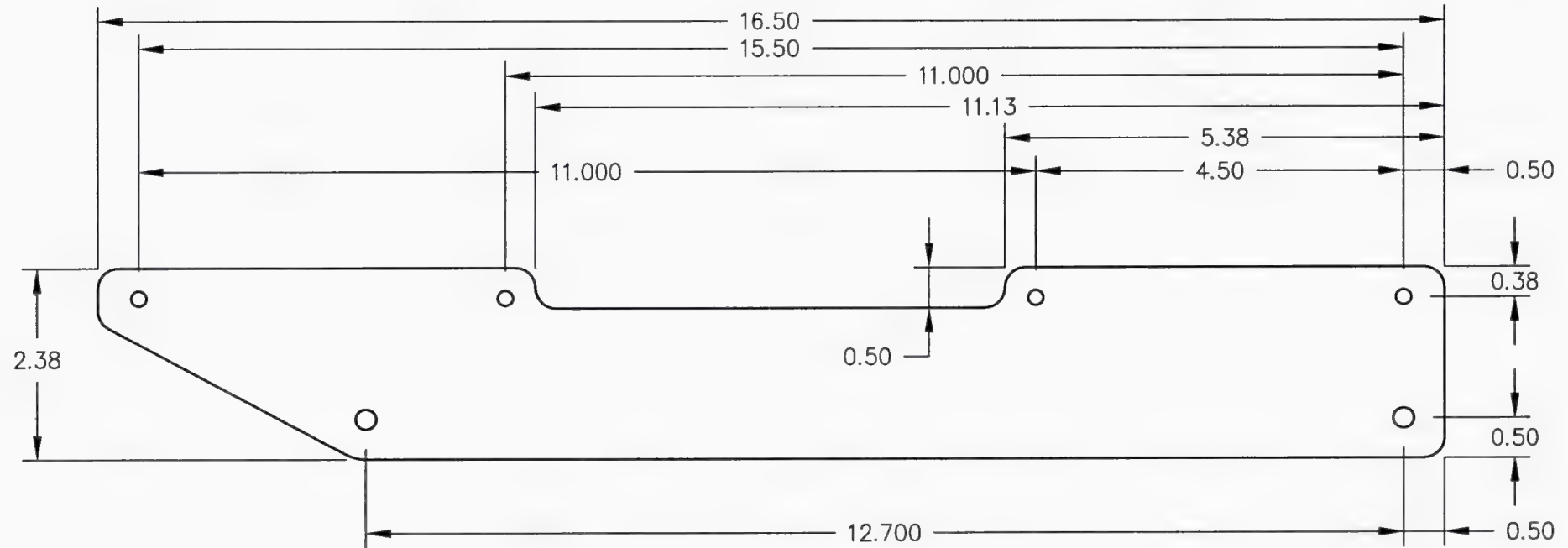
02 LUG

60644-02	02	LUG	1018 CARBON STEEL	ASTM A108	ø5/8" ROD
60644-01	01	LUG	1018 CARBON STEEL	ASTM A108	ø5/8" ROD
PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE

LIST OF MATERIALS

	APPROVALS	DATE	<div>AERO DESIGN LTD.</div> <div>CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M 2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7 tel: (403) 250-8027 fax: (403) 250-8333 aerodesign@telusplanet.net</div>			
	DRAWN: JEFF CLARKE	12 AUG 2004				
	CHECKED: E. BURGAIN					
	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2° X.XX ±0.03 X.X ±0.1		BELL 407 AND 206L SERIES HIGH SIDE MOUNTED CARGO BASKET BASKET COMPONENTS - LUGS			
		SCALE 1 : 1	DWG. SIZE	DWG. NO.	REV.	
		SHEET 1 OF 1	LGL	60644	0	

REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE		

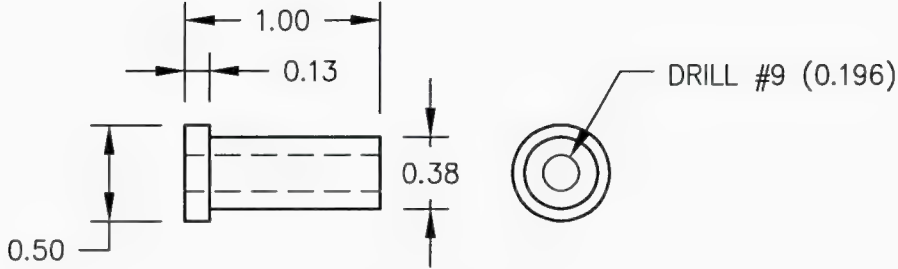


① MOUNTING PLATE

1. REMOVE ALL BURRS AND SHARP EDGES.
2. ALL ALUMINUM PARTS TO BE THOROUGHLY DEGREASED, ALODINED AND PAINTED.

60646-01	01	MOUNTING PLATE	6061-T6 ALUMINUM	QQ-A-250/11	0.125" SHEET
PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE
LIST OF MATERIALS					
	APPROVALS		DATE		
	DRAWN: JEFF CLARKE		12 AUG 2004		
	CHECKED: E. BURGAIN				
	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON:		AERO DESIGN LTD. CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M 2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7 tel: (403) 250-8027 fax: (403) 250-8333 aerodesign@telusplanet.net		
	DECIMALS ANGLES X.XXX ±0.010 ±1/2" X.XX ±0.03 X.X ±0.1		BELL 407 AND 206L SERIES HIGH SIDE MOUNTED CARGO BASKET MOUNTING PLATE		
SCALE 1 : 2		DWG. SIZE	DWG. NO.	REV.	
SHEET 1 OF 1		LGL	60646	0	

LIST OF MATERIALS					
PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE
60647-01	01	BUSHING	BRASS		Ø1/2 ROD

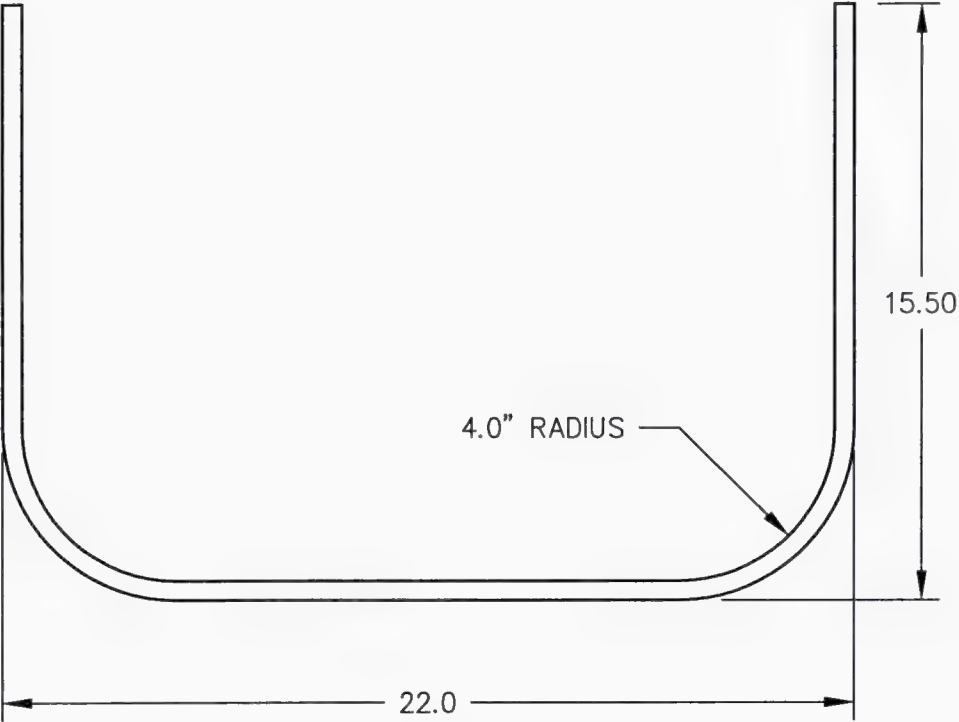


01 BUSHING

0	INITIAL ISSUE		
REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
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APPROVALS		DATE		<div>AERO DESIGN LTD.</div> <div>CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M</div> <div>2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7</div> <div>tel: (403) 250-8027 fax: (403) 250-8333 aerodesign@telusplanet.net</div>			
DRAWN: JEFF CLARKE		18 AUG 2004					
CHECKED: E. BURGAIN							
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2° X.XX ±0.03 X.X ±0.1				BELL 206L AND 407 HIGH SIDE MOUNTED CARGO BASKET BUSHING			
SCALE 1 : 1		DWG. SIZE		DWG. NO.		REV.	
SHEET 1 OF 1		LGL		60647		0	

QTY	LIST OF MATERIALS					
01	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC.	STOCK SIZE
	60648-01	01	HOOP	4130 STEEL COND. N	MIL-T-6736	1/2" SQR x 0.035 WALL



01 HOOP

- NOTES:
- 1. REMOVE ALL BURRS AND SHARP EDGES.
 - 2. DRILL 3/32" VENT HOLE IN BOTTOM OF HOOP FOR VENTING WELD GASES.

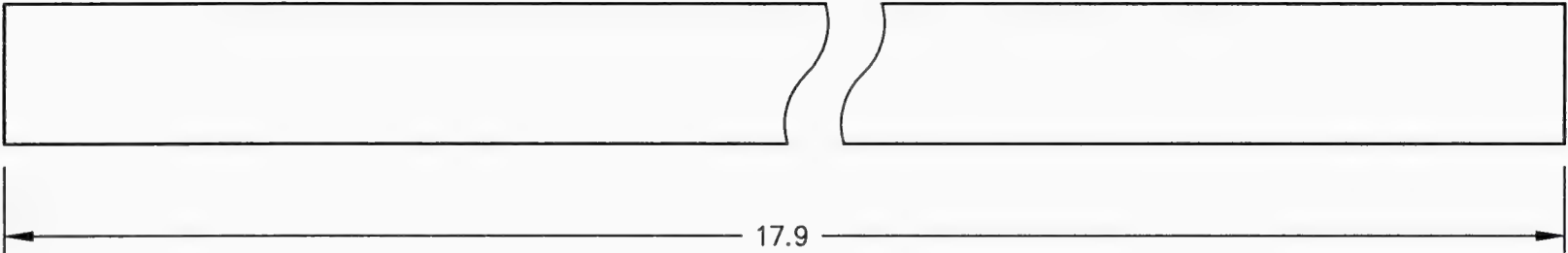
1			
REV.	DESCRIPTION OF CHANGE	INITIALS	DATE

NOTICE

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APPROVALS	DATE	<div>AERO DESIGN LTD.</div> <div>CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M 2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7 tel: (403) 250-8027 fax: (403) 250-8333 aerodesign@telusplanet.net</div>			
DRAWN: JEFF CLARKE	12 AUG 2004				
CHECKED: E. BURGOIN					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2° X.XX ±0.03 X.X ±0.1		BELL 407 AND 206L SERIES HIGH SIDE MOUNTED CARGO BASKET BASKET COMPONENTS - HOOP			
SCALE 1 : 5		DWG. SIZE	DWG. NO.	REV.	
SHEET 1 OF 1		A1	60648	0	

LIST OF MATERIALS					
PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC.	STOCK SIZE
60649-01	01	STEP BRACE	4130 STEEL COND. N	MIL-T-6736	3/4" SQR x 0.035" WALL



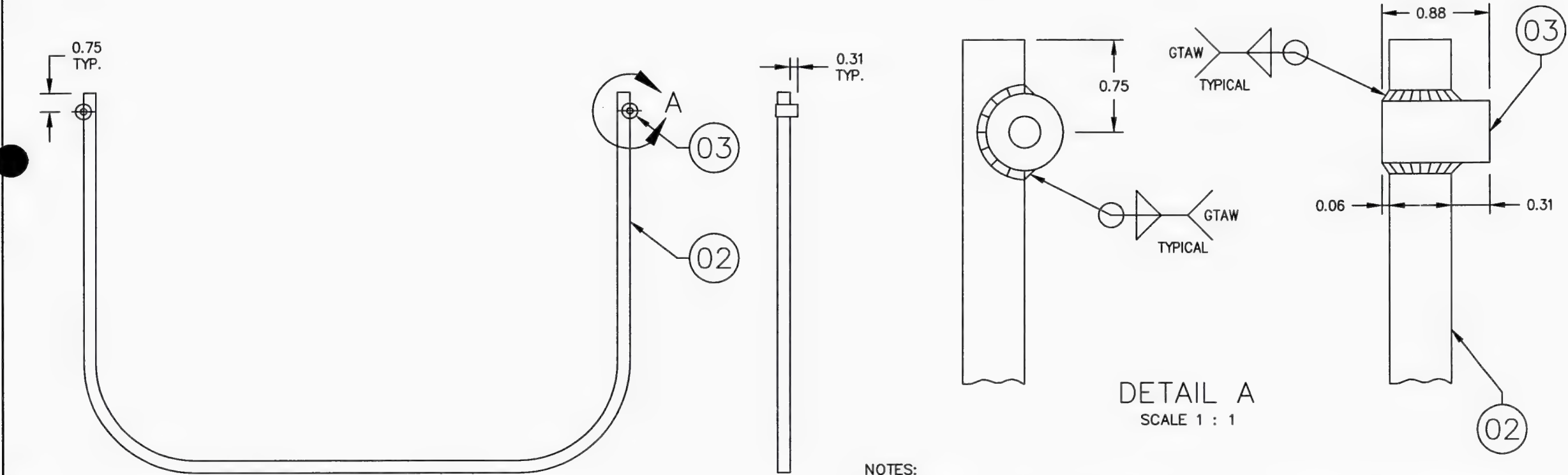
01 STEP BRACE

- NOTES:
1. REMOVE ALL BURRS AND SHARP EDGES.
 2. DRILL 3/32" VENT HOLE NEAR END FOR VENTING WELD GASES.

1			
REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
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APPROVALS	DATE	AERO DESIGN LTD. ENGINEERING CONSULTANTS 1045 McTAVISH ROAD N.E. CALGARY, ALBERTA T2E 7G9			
DRAWN: JEFF CLARKE	12 AUG 2004				
CHECKED: E. BURGOIN					
STRESS:		BELL 407, 206L SEREIS HIGH SIDE MOUNTED CARGO BASKET BASKET COMPONENTS – STEP BRACE			
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2" X.XX ±0.03 X.X ±0.1		SCALE 1 : 1	DWG. SIZE	DWG. NO.	REV.
		SHEET 1 OF 1	LGL	60649	0

LIST OF MATERIALS						
QTY.	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC.	STOCK SIZE
2	49217-01	03	LUG			
1	49210-01	02	HOOP			
	49209-01	01	END HOOP ASSEMBLY			



01 END HOOP ASSEMBLY

- NOTES:
- WELDING OF 4130 STEEL TO BE COMPLETED BY GTAW METHOD TO AMS 2685C. WELDING ROD SHALL CONFORM TO AMS 6457A OR LATER REVISION.

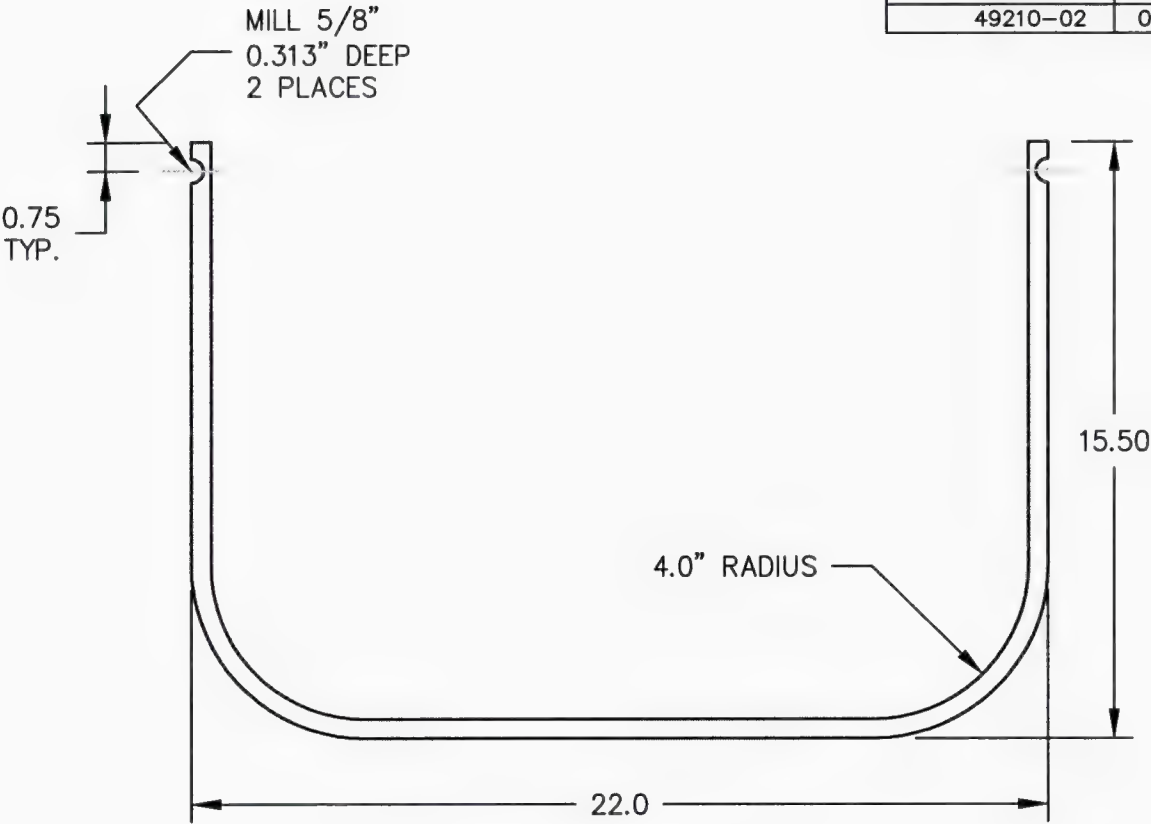
1	LUGS MODIFIED	BJC	APR 28/04
REV.	DESCRIPTION OF CHANGE	INITIALS	DATE

NOTICE

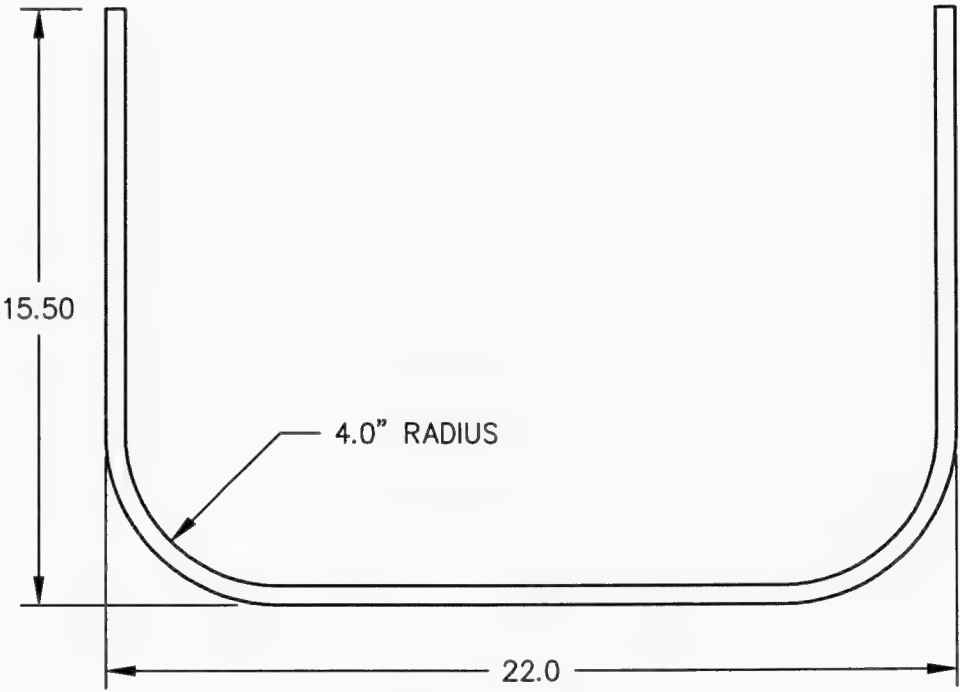
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APPROVALS	DATE	AERO DESIGN LTD. CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M 2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7 tel: (403) 250-8027 fax: (403) 250-8333 aerodesign@telusplanet.net			
DRAWN: STEVEN FAHEY	MAY 10/02				
CHECKED: E. BURGOIN	MAY 10/02				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2° X.XX ±0.03 X.X ±0.1		BELL 206L SIDE-MOUNTED CARGO BASKET END HOOP ASSEMBLY			
		SCALE 1 : 5	DWG. SIZE	DWG. NO.	REV.
		SHEET 1 OF 1	LGL	49209	1
				CHG.	

LIST OF MATERIALS					
PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC.	STOCK SIZE
49210-01	01	END HOOP	4130 SQUARE TUBING	MIL-T-6736	ø1/2" x 0.035 WALL
49210-02	02	HOOP	4130 SQUARE TUBING	MIL-T-6736	ø1/2" x 0.035 WALL



01 END HOOP



02 HOOP

- NOTES:
1. REMOVE ALL BURRS AND SHARP EDGES.
 2. DRILL 3/32" VENT HOLE IN BOTTOM OF HOOPS FOR VENTING WELD GASES.

1	HOOP HEIGHT CHANGED	BJC	APR 28/04
REV.	DESCRIPTION OF CHANGE	INITIALS	DATE

NOTICE

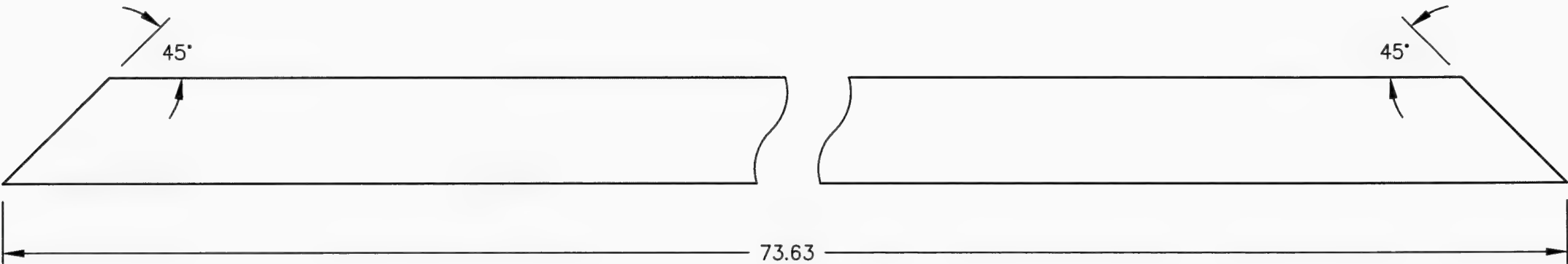
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APPROVALS	DATE
DRAWN: STEVEN FAHEY	MAY 10/02
CHECKED: E. BURGOIN	MAY 10/02
STRESS:	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON:			
DECIMALS		ANGLES	
X.XXX	±0.010		±1/2°
X.XX	±0.03		
X.X	±0.1		

AERO DESIGN LTD. ENGINEERING CONSULTANTS 1045 McTAVISH ROAD N.E. CALGARY, ALBERTA T2E 7G9			
BELL 206L SIDE-MOUNTED CARGO BASKET BASKET COMPONENTS – HOOPS			
SCALE 1 : 5	DWG. SIZE	DWG. NO.	REV.
SHEET 1 OF 1	LGL	49210	1

LIST OF MATERIALS					
PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC.	STOCK SIZE
49211-01	01	RIM	4130 SQUARE TUBING	MIL-T-6736	ø3/4" x 0.035 WALL



01 RIM

NOTES:
1. REMOVE ALL BURRS AND SHARP EDGES.

APPROVALS	DATE
DRAWN: STEVEN FAHEY	MAY 10/02
CHECKED: E. BURGAIN	MAY 10/02
STRESS:	

AERO DESIGN LTD.
ENGINEERING CONSULTANTS
1045 McTAVISH ROAD N.E.
CALGARY, ALBERTA T2E 7G9

1	CHANGED LENGTH (WAS 74.0)	BJC	MAY 7/04
REV.	DESCRIPTION OF CHANGE	INITIALS	DATE

NOTICE

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UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON:
DECIMALS ANGLES
X.XXX ±0.010 ±1/2°
X.XX ±0.03
X.X ±0.1

BELL 206L
SIDE-MOUNTED CARGO BASKET
BASKET COMPONENTS - RIM

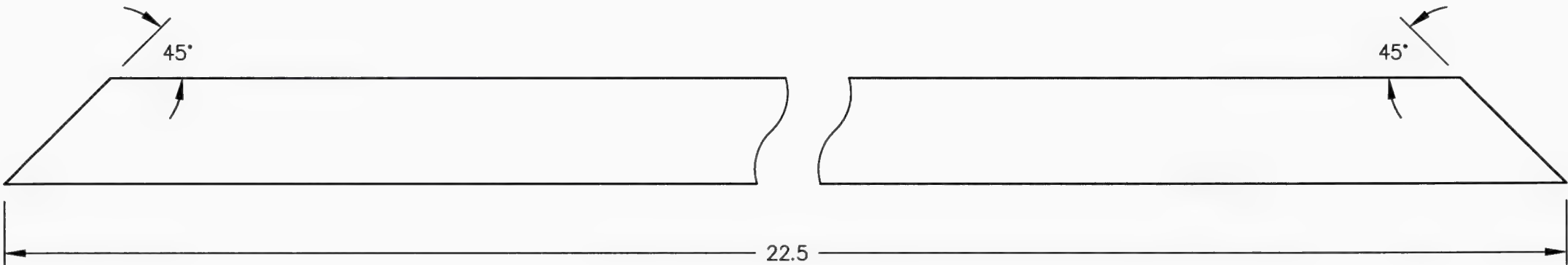
SCALE 1 : 1
SHEET 1 OF 1

DWG. SIZE
LGL

DWG. NO.
49211

REV.
1

LIST OF MATERIALS					
PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC.	STOCK SIZE
49212-01	01	RIM	4130 SQUARE TUBING	MIL-T-6736	ø3/4" x 0.035 WALL



01 RIM

- NOTES:
- 1. REMOVE ALL BURRS AND SHARP EDGES.
 - 2. DRILL 3/32" VENT HOLE NEAR END FOR VENTING WELD GASES.

APPROVALS	DATE
DRAWN: STEVEN FAHEY	MAY 10/02
CHECKED: E. BURGAIN	MAY 10/02
STRESS:	

AERO DESIGN LTD.
ENGINEERING CONSULTANTS
1045 McTAVISH ROAD N.E.
CALGARY, ALBERTA T2E 7G9

BELL 206L
SIDE-MOUNTED CARGO BASKET
BASKET COMPONENTS - RIM

1			
REV.	DESCRIPTION OF CHANGE	INITIALS	DATE

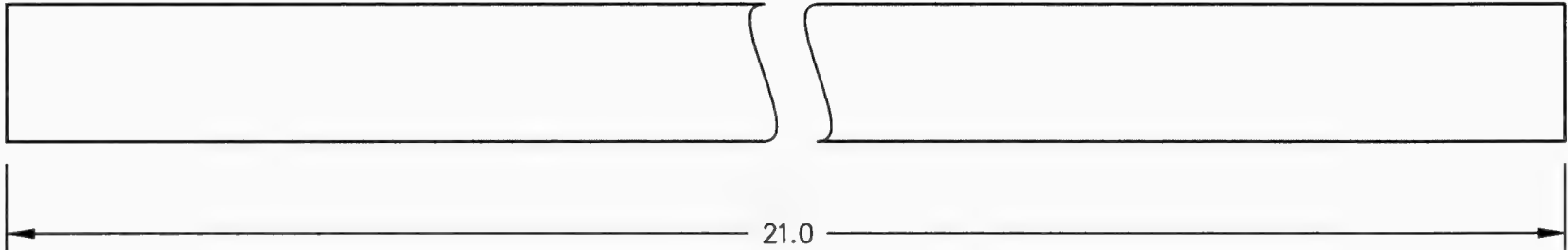
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DECIMALS		ANGLES	
X.XXX	±0.010		±1/2°
X.XX	±0.03		
X.X	±0.1		

SCALE 1 : 1	DWG. SIZE	DWG. NO.	REV.	
	LGL	49212	0	
SHEET 1 OF 1				

LIST OF MATERIALS					
PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC.	STOCK SIZE
49213-01	01	LID BRACE	4130 SQUARE TUBING	MIL-T-6736	3/4" x 0.035 WALL SQR



01 LID BRACE

- NOTES:
1. REMOVE ALL BURRS AND SHARP EDGES.
 2. DRILL 3/32" VENT HOLE NEAR END FOR VENTING WELD GASES.

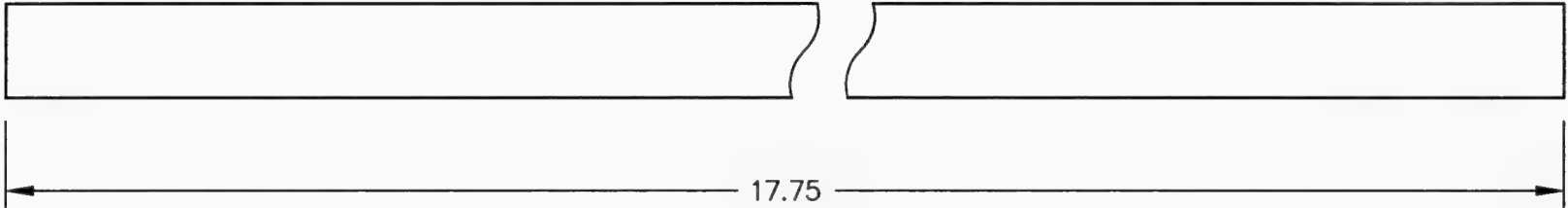
1	MATERIAL CHANGED TO 3/4" SQUARE TUBE	BJC	MAY 7/04
REV.	DESCRIPTION OF CHANGE	INITIALS	DATE

NOTICE

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APPROVALS		DATE		AERO DESIGN LTD. ENGINEERING CONSULTANTS 1045 McTAVISH ROAD N.E. CALGARY, ALBERTA T2E 7G9					
DRAWN: STEVEN FAHEY		MAY 10/02							
CHECKED: E. BURGOIN		MAY 10/02							
STRESS:									
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2" X.XX ±0.03 X.X ±0.1				BELL 206L SIDE-MOUNTED CARGO BASKET BASKET COMPONENTS – LID BRACE					
				SCALE 1 : 1		DWG. SIZE	DWG. NO.	REV.	
				SHEET 1 OF 1		LGL	49213	1	

LIST OF MATERIALS					
PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC.	STOCK SIZE
49214-01	01	SPINE	4130 SQUARE TUBING	MIL-T-6736	1/2" x 0.035" WALL



01 SPINE

- NOTES:
- 1. REMOVE ALL BURRS AND SHARP EDGES.
 - 2. DRILL 3/32" VENT HOLE NEAR END FOR VENTING WELD GASES.

APPROVALS	DATE
DRAWN: STEVEN FAHEY	MAY 10/02
CHECKED: E. BURGOIN	MAY 10/02
STRESS:	

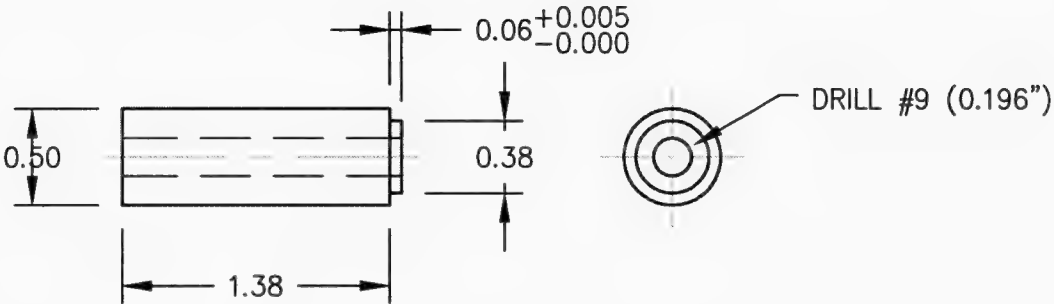
AERO DESIGN LTD.
ENGINEERING CONSULTANTS
1045 McTAVISH ROAD N.E.
CALGARY, ALBERTA T2E 7G9

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON:	
DECIMALS	ANGLES
X.XXX ±0.010	±1/2°
X.XX ±0.03	
X.X ±0.1	

BELL 206L SIDE-MOUNTED CARGO BASKET BASKET COMPONENTS - SPINE			
SCALE 1 : 1	DWG. SIZE LGL	DWG. NO. 49214	REV. 0
SHEET 1 OF 1			

1			
REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
<p>NOTICE</p> <p>THIS DRAWING CONTAINS INFORMATION AND DATA WHICH IS PROPRIETARY TO AERO DESIGN LTD. THIS DRAWING, OR ANY PORTION THEREOF, MAY NOT BE REPRODUCED, COPIED, OR DUPLICATED IN ANY MANNER, NOR USED FOR MANUFACTURING WITHOUT THE WRITTEN CONSENT OF AERO DESIGN LTD. BY ACCEPTING THIS DRAWING FOR REFERENCE, THE RECIPIENT AGREES TO HOLD AERO DESIGN LTD. HARMLESS FROM THE USE, OR MISUSE, OF THIS DRAWING OR THE INFORMATION CONTAINED THEREON.</p>			

LIST OF MATERIALS					
PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC.	STOCK SIZE
49215-01	01	SPACER	MILD STEEL	AISI 1010/1020	Ø1/2" OD BAR



01 SPACER

NOTES:
1. REMOVE ALL BURRS AND SHARP EDGES.

1			
REV.	DESCRIPTION OF CHANGE	INITIALS	DATE

NOTICE

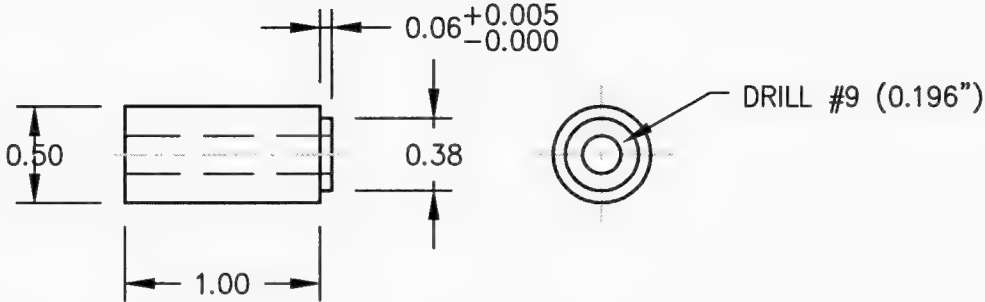
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APPROVALS	DATE
DRAWN: STEVEN FAHEY	MAY 10/02
CHECKED: E. BURGOIN	MAY 10/02
STRESS:	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON:			
DECIMALS		ANGLES	
X.XXX	±0.010		±1/2°
X.XX	±0.03		
X.X	±0.1		

AERO DESIGN LTD. ENGINEERING CONSULTANTS 1045 McTAVISH ROAD N.E. CALGARY, ALBERTA T2E 7G9			
BELL 206L SIDE-MOUNTED CARGO BASKET BASKET COMPONENTS - SPACER			
SCALE 1 : 1	DWG. SIZE	DWG. NO.	REV.
SHEET 1 OF 1	LGL	49215	0

LIST OF MATERIALS					
PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC.	STOCK SIZE
49216-01	01	SPACER	MILD STEEL	AISI 1010/1020	Ø1/2" OD BAR



01 SPACER

NOTES:
1. REMOVE ALL BURRS AND SHARP EDGES.

APPROVALS	DATE
DRAWN: STEVEN FAHEY	MAY 10/02
CHECKED: E. BURGOIN	MAY 10/02
STRESS:	

AERO DESIGN LTD.
ENGINEERING CONSULTANTS
1045 McTAVISH ROAD N.E.
CALGARY, ALBERTA T2E 7G9

BELL 206L
SIDE-MOUNTED CARGO BASKET
BASKET COMPONENTS – SPACER

1			
REV.	DESCRIPTION OF CHANGE	INITIALS	DATE

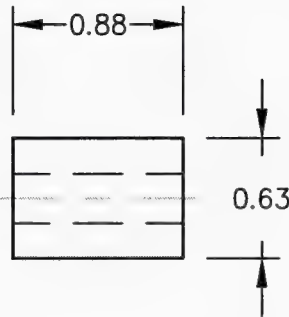
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UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON:
DECIMALS ANGLES
X.XXX ±0.010 ±1/2°
X.XX ±0.03
X.X ±0.1

SCALE 1 : 1	DWG. SIZE	DWG. NO.	REV.	
SHEET 1 OF 1	LGL	49216	0	

LIST OF MATERIALS					
PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC.	STOCK SIZE
49217-01	01	LUG	MILD STEEL	AISI 1010/1020	ø5/8 OD BAR



01 LUG

NOTES:
1. REMOVE ALL BURRS AND SHARP EDGES.

1	LENGTH OF LUG REDUCED	BJC	APR 28/04
REV.	DESCRIPTION OF CHANGE	INITIALS	DATE

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APPROVALS	DATE
DRAWN: STEVEN FAHEY	MAY 10/02
CHECKED: E. BURGAIN	MAY 10/02
STRESS:	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON:	
DECIMALS	ANGLES
X.XXX ±0.010	±1/2°
X.XX ±0.03	
X.X ±0.1	

AERO DESIGN LTD. ENGINEERING CONSULTANTS 1045 McTAVISH ROAD N.E. CALGARY, ALBERTA T2E 7G9			
BELL 206L SIDE-MOUNTED CARGO BASKET BASKET COMPONENTS – LUG			
SCALE 1 : 1	DWG. SIZE	DWG. NO.	REV.
SHEET 1 OF 1	LGL	49217	1

NOTICE

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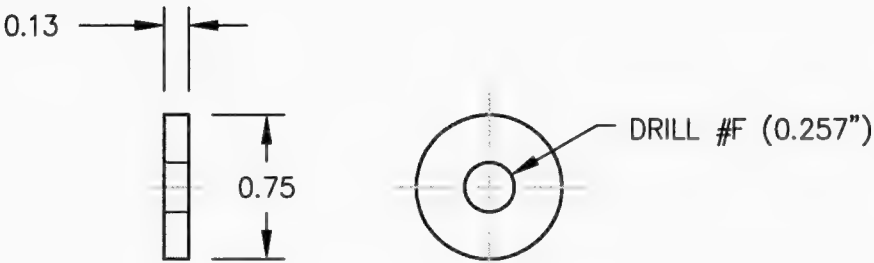
REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
1	ADDED BELL 407	BJC	MAR 26/04



01 PLACARD

49218-01		01	PLACARD	3M SCOTCHCAL 7725-10 (0.09mm) VINYL			
PART NO.		ITEM	DESCRIPTION	MATERIAL			
LIST OF MATERIALS							
APPROVALS		DATE		<div>AERO DESIGN LTD.</div> <div>CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M 2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7 tel: (403) 250-8027 fax: (403) 250-8333 aerodesign@telusplanet.net</div>			
DRAWN: STEVEN FAHEY		MAY 16/02					
CHECKED: E. BURGAIN		MAY 16/02					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2° X.XX ±0.03 X.X ±0.1			BELL 206L SERIES AND 407 SIDE-MOUNTED CARGO BASKET PLACARD				
			SCALE 1 : 1		DWG. SIZE A1	DWG. NO. 49218	REV. 1
			SHEET 1 OF 1				

LIST OF MATERIALS					
PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC.	STOCK SIZE
49219-01	01	SPACER	AISI 304 SS	MIL-S-5059	ø3/4 DIA RND. BAR



01 SPACER

NOTES:
1. REMOVE ALL BURRS AND SHARP EDGES.

APPROVALS	DATE
DRAWN: JEFF CLARKE	28 APR 2004
CHECKED: E. BURGOIN	
STRESS:	

AERO DESIGN LTD.
ENGINEERING CONSULTANTS
1045 McTAVISH ROAD N.E.
CALGARY, ALBERTA T2E 7G9

1			
REV.	DESCRIPTION OF CHANGE	INITIALS	DATE

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UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON:
DECIMALS ANGLES
X.XXX ±0.010 ±1/2°
X.XX ±0.03
X.X ±0.1

BELL 206L

SIDE-MOUNTED CARGO BASKET

BASKET COMPONENTS – SPACER

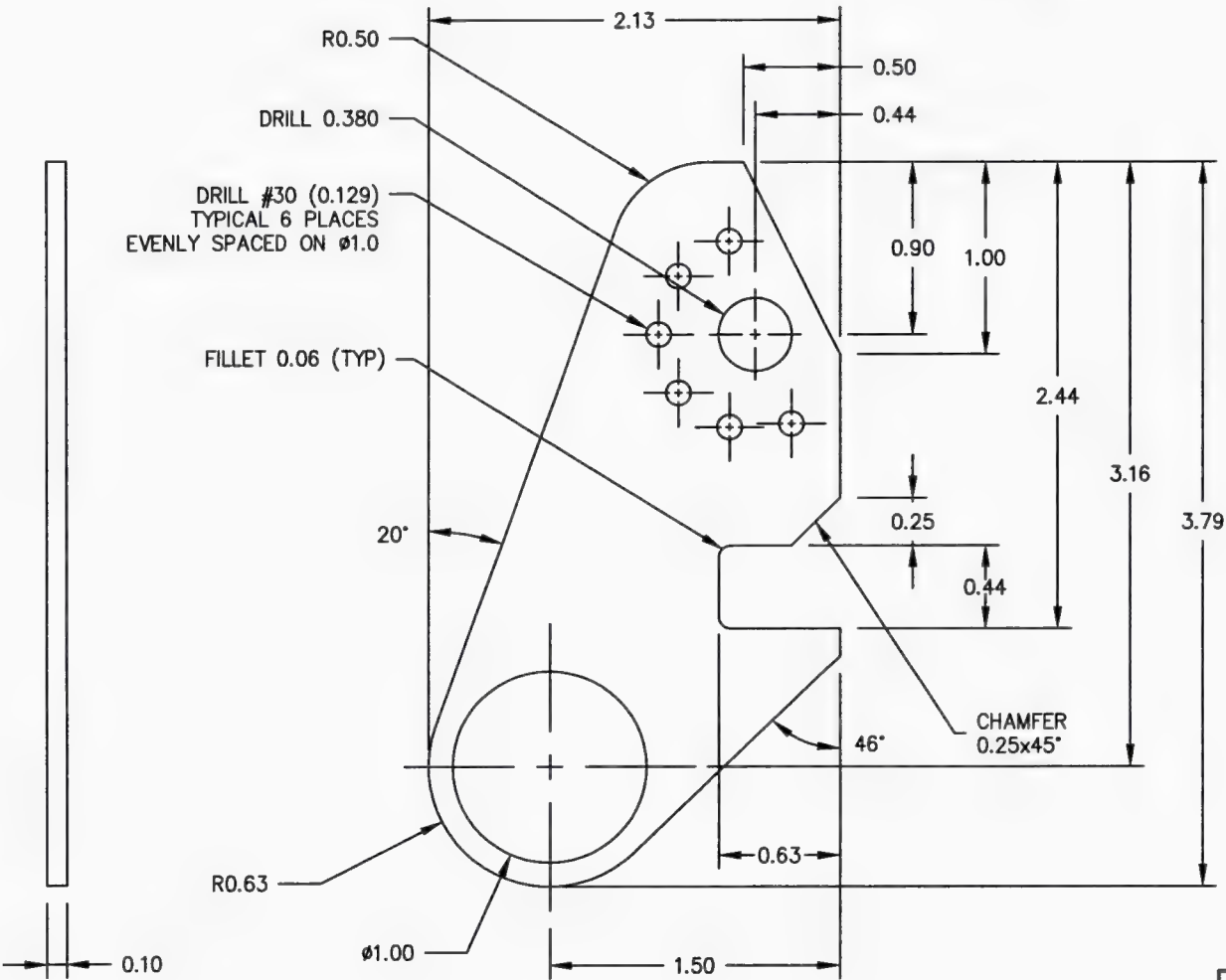
SCALE 1 : 1
SHEET 1 OF 1

DWG. SIZE
LGL

DWG. NO.
49219

REV.
0

LIST OF MATERIALS					
PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC.	STOCK SIZE
36271-01	01	LEVER	AISI 304 STAINLESS	MIL-S-5059	0.125" PLATE



NOTES:
1. REMOVE ALL BURRS AND SHARP EDGES.

01 LEVER

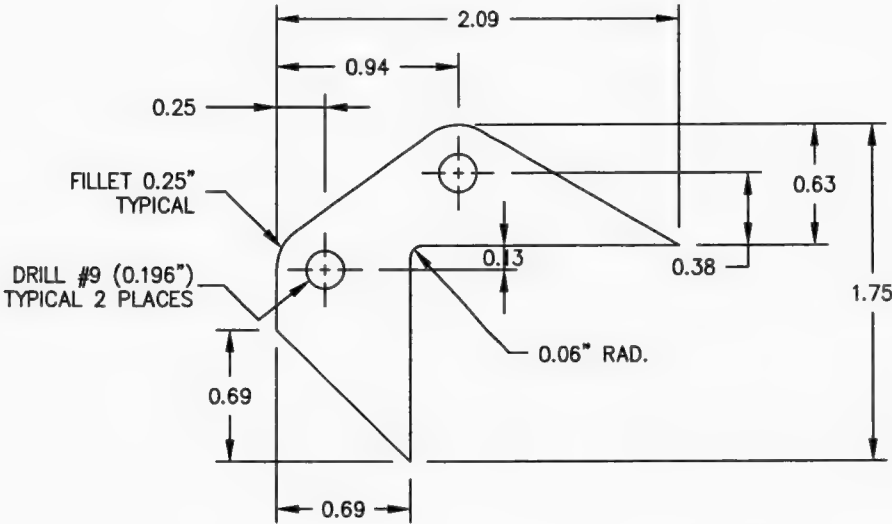
0	INITIAL ISSUE — CREATED FROM 36210	STF	MAY 17/02
REV.	DESCRIPTION OF CHANGE	INITIALS	DATE

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APPROVALS		DATE		<div>AERO DESIGN LTD.</div> <div>CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M</div> <div>2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7</div> <div>tel: (403) 250-8027 fax: (403) 250-8333 aerodesign@telusplanet.net</div>			
DRAWN: STEVEN FAHEY		MAY 17/02					
CHECKED: E. BURGOIN		MAY 01/03					
<div>UNLESS OTHERWISE SPECIFIED</div> <div>DIMENSIONS ARE IN INCHES.</div> <div>TOLERANCES ON:</div> <div>DECIMALS ANGLES</div> <div>X.XXX ±0.010 ±1/2°</div> <div>X.XX ±0.03</div> <div>X.X ±0.1</div>				<div>HELICOPTER CARGO BASKET</div> <div>HANDLE LEVER</div>			
				SCALE 1 : 1		DWG. SIZE	DWG. NO.		REV.
SHEET 1 OF 1		LGL	36271		0		

LIST OF MATERIALS					
PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC.	STOCK SIZE
36273-01	01	LID BRACKET	AISI 4130, COND. N	MIL-S-18729	0.050" SHEET

NOTES:
1. REMOVE ALL BURRS AND SHARP EDGES.

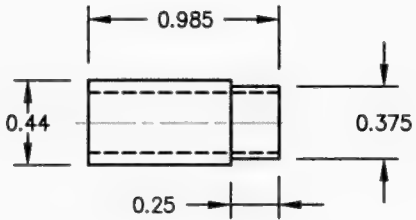


01 LID BRACKET

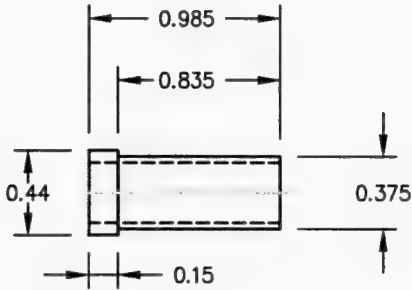
0	INITIAL ISSUE - CREATED FROM 36210	STF	MAY 17/02
REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
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APPROVALS	DATE	AERO DESIGN LTD. CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M 2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7 tel: (403) 250-8027 fax: (403) 250-8333 aerodesign@telusplanet.net			
DRAWN: STEVEN FAHEY	MAY 17/02				
CHECKED: E. BURGOIN	MAY 01/03				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2° X.XX ±0.03 X.X ±0.1		HELICOPTER CARGO BASKET LID BRACKET			
		SCALE 1 : 1	DWG. SIZE	DWG. NO.	REV.
		SHEET 1 OF 1	LGL	36273	0

LIST OF MATERIALS					
PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC.	STOCK SIZE
36274-01	01	BUSHING	AISI 304 STAINLESS		7/16" X 0.065" TUBE



01 BUSHING
ALTERNATE PART



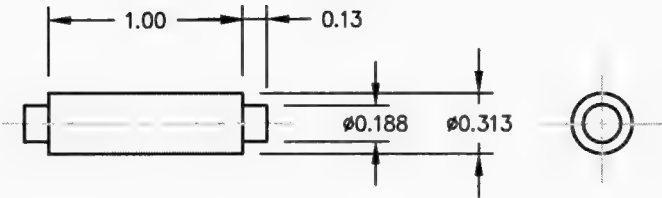
01 BUSHING

- NOTES:
- 1. REMOVE ALL BURRS AND SHARP EDGES.

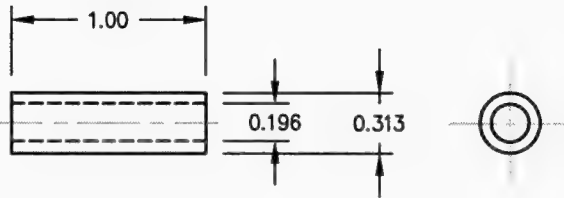
0	INITIAL ISSUE – CREATED FROM 36210	STF	MAY 17/02
REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
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APPROVALS		DATE		AERO DESIGN LTD. CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M 2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7 tel: (403) 250-8027 fax: (403) 250-8333 aerodesign@telusplanet.net							
DRAWN: STEVEN FAHEY		MAY 17/02									
CHECKED: E. BURGAIN		MAY 01/03									
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2° X.XX ±0.03 X.X ±0.1				HELICOPTER CARGO BASKET HANDLE LEVER BUSHING							
				SCALE 1 : 1		DWG. SIZE		DWG. NO.		REV.	
				SHEET 1 OF 1		LGL		36274		0	

LIST OF MATERIALS					
PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC.	STOCK SIZE
36275-01	01	BUSHING	SAE 660 BRONZE		5/16" X 0.065" TUBE
36275-02	02	SUPPORT	304 STAINLESS STEEL		5/16" X 0.065" TUBE



02 SUPPORT



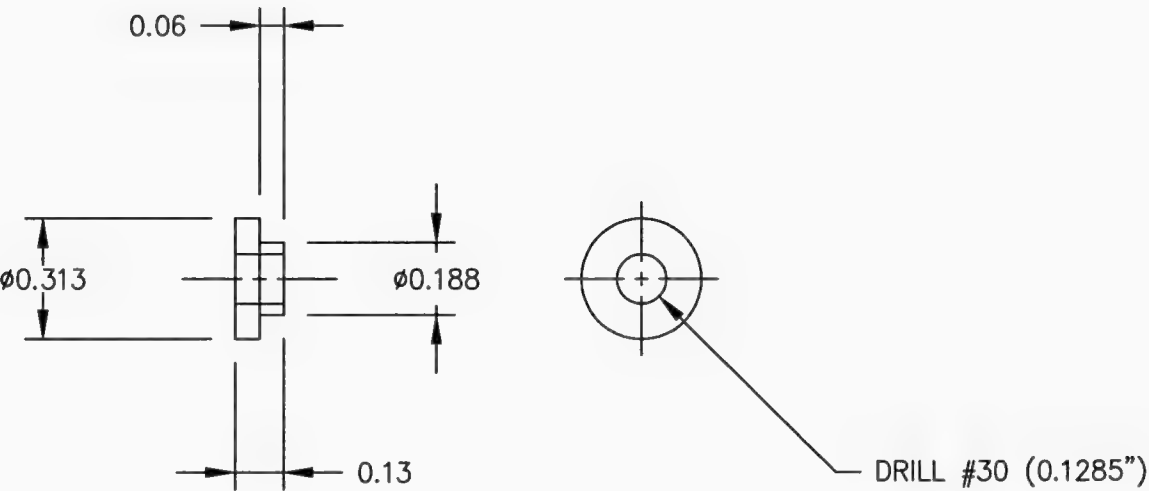
01 BUSHING

NOTES:
 1. REMOVE ALL BURRS AND SHARP EDGES.

1	ADDED PART 02. BUSHING WAS STAINLESS STEEL	STF	JUN 03/04
0	INITIAL ISSUE – CREATED FROM 36210	STF	MAY 17/02
REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
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APPROVALS		DATE		<div>AERO DESIGN LTD.</div> <div>CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M</div> <div>2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7</div> <div>tel: (403) 250-8027 fax: (403) 250-8333 aerodesign@telusplanet.net</div>			
DRAWN: STEVEN FAHEY		MAY 17/02					
CHECKED: E. BURGOIN		MAY 01/03					
<div>UNLESS OTHERWISE SPECIFIED</div> <div>DIMENSIONS ARE IN INCHES.</div> <div>TOLERANCES ON:</div> <div>DECIMALS ANGLES</div> <div>X.XXX ±0.010 ±1/2°</div> <div>X.XX ±0.03</div> <div>X.X ±0.1</div>				HELICOPTER CARGO BASKET			
				HANDLE BUSHING AND SUPPORT			
				SCALE 1 : 1		DWG. SIZE	DWG. NO.	REV.
SHEET 1 OF 1		LGL	36275	1			

LIST OF MATERIALS					
PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC.	STOCK SIZE
36276-01	01	SPRING HOOK	6061 ALUMINUM		5/16" ROD



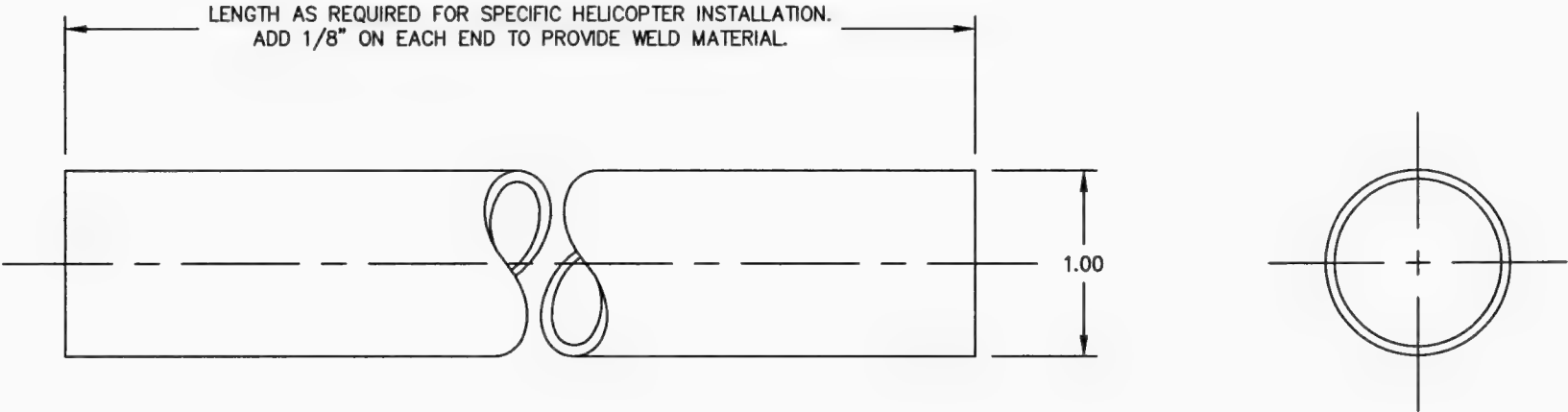
NOTES:

1. REMOVE ALL BURRS AND SHARP EDGES.

0	INITIAL ISSUE – CREATED FROM 36210	STF	MAY 17/02
REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
THIS DRAWING CONTAINS INFORMATION AND DATA WHICH IS PROPRIETARY TO AERO DESIGN LTD. THIS DRAWING, OR ANY PORTION THEREOF, MAY NOT BE REPRODUCED, COPIED, OR DUPLICATED IN ANY MANNER, NOR USED FOR MANUFACTURING WITHOUT THE WRITTEN CONSENT OF AERO DESIGN LTD. BY ACCEPTING THIS DRAWING FOR			

APPROVALS		DATE		<div>AERO DESIGN LTD.</div> <div>CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M</div> <div>2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7</div> <div>tel: (403) 250-8027 fax: (403) 250-8333 aerodesign@telusplanet.net</div>			
DRAWN: STEVEN FAHEY		MAY 17/02					
CHECKED: E. BURGOIN		MAY 01/03					
<div>UNLESS OTHERWISE SPECIFIED</div> <div>DIMENSIONS ARE IN INCHES.</div> <div>TOLERANCES ON:</div> <div>DECIMALS ANGLES</div> <div>X.XXX ±0.010 ±1/2°</div> <div>X.XX ±0.03</div> <div>X.X ±0.1</div>				<div>HELICOPTER CARGO BASKET</div> <div>SPRING HOOK</div>			
				SCALE 2 : 1		DWG. SIZE	DWG. NO.		REV.
SHEET 1 OF 1		LGL	36276		0		

LIST OF MATERIALS					
PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC.	STOCK SIZE
36277-01	01	HANDLE BAR	AISI 316 STAINLESS	ASTM A213	1.0" X 0.035" TUBE



01 HANDLE BAR

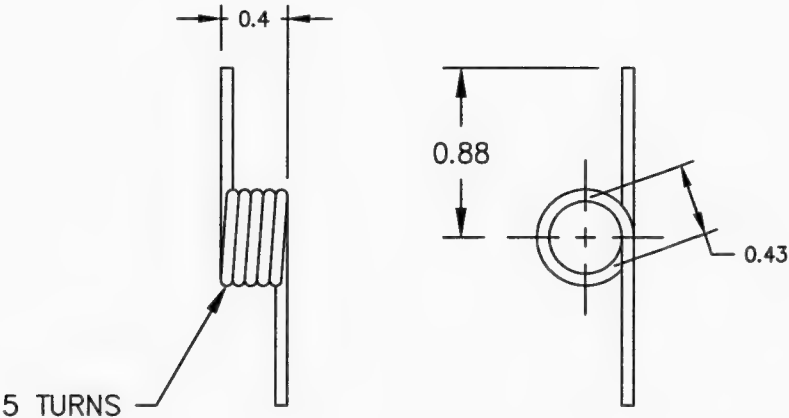
- NOTES:
- 1. REMOVE ALL BURRS AND SHARP EDGES.

0	INITIAL ISSUE – CREATED FROM 36210	STF	MAY 17/02
REV.	DESCRIPTION OF CHANGE	INITIALS	DATE

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APPROVALS		DATE		<div>AERO DESIGN LTD.</div> <div>CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M</div> <div>2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7</div> <div>tel: (403) 250-8027 fax: (403) 250-8333 aerodesign@telusplanet.net</div>					
DRAWN: STEVEN FAHEY		MAY 17/02							
CHECKED: E. BURGOIN		MAY 01/03							
<div>UNLESS OTHERWISE SPECIFIED</div> <div>DIMENSIONS ARE IN INCHES.</div> <div>TOLERANCES ON:</div> <div>DECIMALS ANGLES</div> <div>X.XXX ±0.010 ±1/2°</div> <div>X.XX ±0.03</div> <div>X.X ±0.1</div>				<div>HELICOPTER CARGO BASKET</div> <div>HANDLE BAR</div>					
								SCALE 1 : 1		DWG. SIZE	DWG. NO.	REV.
				SHEET 1 OF 1		LGL	36277	0	

LIST OF MATERIALS					
PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC.	STOCK SIZE
36278-01	01	SPRING	MUSIC WIRE	SAE 1085	1/16" WIRE TORSION SPRING



01 SPRING
(RELAXED POSITION)
LH SHOWN, RH OPPOSITE

1	LENGTH OF SPRING CHANGED	BJC	APR 13/04
0	INITIAL ISSUE – CREATED FROM 36210	STF	MAY 17/02
REV.	DESCRIPTION OF CHANGE	INITIALS	DATE

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APPROVALS		DATE		<div>AERO DESIGN LTD.</div> <div>CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M 2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7 tel: (403) 250-8027 fax: (403) 250-8333 aerodesign@telusplanet.net</div>			
DRAWN: STEVEN FAHEY		MAY 17/02					
CHECKED: E. BURGOIN		MAY 01/03					
<div>UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2° X.XX ±0.03 X.X ±0.1</div>				<div>HELICOPTER CARGO BASKET SPRING</div>			
				SCALE 1 : 1		DWG. SIZE		DWG. NO.		REV.
SHEET 1 OF 1		LGL		36278		1	

1 November, 2007

Transport Canada
Aircraft Certification Division
11th Floor, Canada Place
9700 Jasper Avenue
Edmonton, Alberta
T5J 4E6

Attn: Jack Staal

Your File # : SH00-48

Our File # : Various

Re: Cargo Basket Approval Revisions

Jack,

Please find attached the following documents related to this project:

Supplemental Type Certificate (draft)	✓SH00-48	Issue 6
(High Quick Release Basket)		
Document Control List	✓DCL766-1	Revision 0
Document Control List	✓DCL766-2	Revision 0
AE 100 Form	✓AE766-1	Revision 0
AE 100 Form	✓AE766-2	Revision 0
Compliance Program	✓CP766	Revision 0
Modification Approval Application Form	✓MOD766	Revision 0
Engineering Report	✓ER766.01	Revision 0
Test Plan	✓TP766.02	Revision 0
Instructions for Continued Airworthiness	✓ICA766.90	Revision 0
MSI 53 Review	✓	
Flight Manual Supplement (407)	✓FMS766.91	Revision 0
Flight Manual Supplement (206L)	✓FMS766.92	Revision 0
Cargo Basket Installation	✓76601	Revision 0
Cargo Basket Assembly	✓76610	Revision 0
Cargo Basket Body	✓76611	Revision 0
Basket Components - End Hoop Assembly	✓76621	Revision 0
Basket Comp. - Attach Hoop Assembly	✓76622	Revision 0
Basket Components - Hoop	✓76623	Revision 0
Basket Components - Placard	✓76625	Revision 0
Support Beams	✓76630	Revision 0
Handle Assembly	✓36255	Revision 1
Handle Bar Assembly	✓36261	Revision 3
Handle Bracket Assembly	✓36262	Revision 1
Handle Lever	✓36271	Revision 1
Basket Bracket	✓36272	Revision 1
Lid Bracket	✓36273	Revision 1
Bushing	✓36274	Revision 1
Bushing	✓36275	Revision 2

Not Current

ISSUE 5 IN 698

FORM AE-100

DEPARTMENT OF TRANSPORT STATEMENT OF COMPLIANCE OF AIRCRAFT OR AIRCRAFT COMPONENTS WITH THE AIRWORTHINESS REQUIREMENTS		AE-100 No.: AE606 Initial Issue Date: 6 July, 2004 Revision: 2 Revision Date: 1 November 2007 Approval No.: SH00-48 Delegation No.: 290M Delegate Name: E. Burgoin Classification of Designee Employer: AI RO Design Ltd
Aircraft Mfr: Bell Aircraft Model: 407 Registration: All Eligible	Model Type Airplane <input type="checkbox"/> Helicopter <input checked="" type="checkbox"/> Appliance <input type="checkbox"/> Component <input type="checkbox"/>	

LIST OF APPROVED REPORTS AND DATA			
Document Number	Revision	Document Title	Compliance Status
DCL606	Revision 3	Document Control List and all documents referred to therein	
DCL492-1	Revision 1	Document Control List for Basket Fabrication	
60601	Revision 2	Cargo Basket Installation	
FMS606.01	Revision 2	Flight Manual Supplement (only unapproved sections revised)	
ICA492.90	Revision 1	Instructions for Continued Airworthiness	
DATA APPROVED BY TRANSPORT CANADA			

CERTIFICATION

UNDER THE AUTHORITY VESTED IN ME BY THE DEPARTMENT OF TRANSPORT, I HEREBY CERTIFY THAT THE DATA LISTED ABOVE AND ON THE ATTACHED SHEETS NUMBERED Nil HAVE BEEN EXAMINED IN ACCORDANCE WITH ESTABLISHED PROCEDURES AND FOUND TO COMPLY, TO THE BEST OF MY KNOWLEDGE AND BELIEF WITH THE PERTINENT COMPLIANCE REQUIREMENTS.

I THEREFORE ☐ RECOMMEND FOR APPROVAL OF THESE DATA

☒ APPROVE THESE DATA


 E. Burgoin, DAR 290M

(407 Attachment Provisions)

Document Control List

AE100 Form

Block Fabrication

✓ DCL700 Revision 1
✓ AE700 Revision 1
✓ 60620 Revision 1

(Low Fixed Basket)

Document Control List

Document Control List

AE100 Form

Cargo Basket Installation (206L)

Support Beams (Pocketed Aluminum)

Support Beams (Steel)

Engineering Report - Pocketed Beams

Instructions for Continued Airworthiness

Flight Manual Supplement

Document Control List

AE100 Form

Cargo Basket Installation (407)

Flight Manual Supplement

✓ DCL492 Revision 6
✓ DCL492-1 Revision 1
✓ AE492 Revision 2
✓ 49201 Revision 3
✓ 49221 Revision 3
✓ 49222 Revision 2
✓ ER492.04 Revision 1
✓ ICA492.90 Revision 1
✓ FMS492.01 Revision 2
✓ DCL606 Revision 3
✓ AE606 Revision 2
60601 Revision 2
✓ FMS606.01 Revision 2

(Quick Release Basket Installation)

Document Control List

AE100 Form

Cargo Basket Installation (407)

Flight Manual Supplement

Document Control List

AE100 Form

Cargo Basket Installation (206L)

Flight Manual Supplement

✓ DCL701 Revision 1
✓ AE701 Revision 1
✓ 70101 Revision 2
✓ FMS701.90 Revision 1
✓ DCL702 Revision 1
✓ AE702 Revision 1
✓ 70201 Revision 2
✓ FMS702.90 Revision 1

(Quick Release Basket Fabrication)

Document Control List

AE100 Form

Cargo Basket Assembly

Basket Body Assembly

Basket Components - End Hoop

Basket Components - Aft Hoop

Instructions for Continued Airworthiness

Document Control List

AE100 Form

Forward Beam Fabrication

Aft Beam Fabrication

Engineering Report

✓ DCL698-1 Revision 1
✓ AE698-1 Revision 1
✓ 69810 Revision 2
✓ 69811 Revision 2
✓ 69821 Revision 1
✓ 69822 Revision 0
✓ ICA698.90 Revision 1
✓ DCL698-2 Revision 2
✓ AE698-2 Revision 1
✓ 69830 Revision 2
✓ 69831 Revision 2
✓ ER698.04 Revision 0

AERO DESIGN LTD.

2013 - 39 Avenue N.E., Calgary, Alberta, T2E 6R7

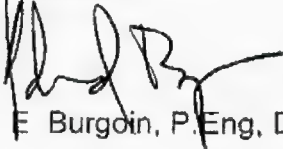
Tei 403-250-8027

Fax 403-250-8333

info@aerodesign.ca

Please note the request for a revision to the FAA STC after the Canadian approval is issued.

Regards,

A handwritten signature in black ink, appearing to read 'E. Burgoin', is written over the printed name.

E. Burgoin, P.Eng, DAR 290M

Encl.

TRANSFER ENDORSEMENT

A transfer of ownership requires a prior approval from the Minister.

The reissue of the certificate in the name of the transferee will be contingent upon a demonstration made by the new owner that he/she can fulfill the responsibilities of the holder as described in airworthiness manual chapter 513.

TRANSFER OF OWNERSHIP

TO (NAME AND ADDRESS OF TRANSFEE)

FROM (NAME AND ADDRESS OF OWNER)

**TRANSFER PARTICULARS (LICENCE
AGREEMENT, SALE OF RIGHTS, ETC.)**

DATE OF TRANSFER

**SIGNATURE
(OF ORIGINAL OWNER)**



Department of Transport

Supplemental Type Certificate

This approval is issued to:

Aero Design Ltd.
2013 - 39 Avenue, N.E.
Calgary, Alberta
Canada T2E 6R7

Number: SH00-48

Issue No.: 4

Approval Date: December 08, 2000

Issue Date: April 14, 2005

Responsible Office:

Prairie and Northern

Aircraft/Engine Type or Model:

BELL 206L, 206L-1, 206L-3, 206L-4, 407

Canadian Type Certificate or Equivalent:

H-92

Description of Type Design Change:

Installation of Cargo Basket / External Attachment
Provisions/Optional step.

**Installation/Operating Data,
Required Equipment and Limitations:**

Bell 407 only:

407 Configuration A - External Attachment Provisions Only:

Installation of the External Attachment Provisions is to be completed in accordance with Transport Canada approved, AERO Design Ltd., Document Control List DCL 606, Rev 1, dated 20 July 2004, or later approved revision, or Document Control List DCL 606-1, Revision 0, dated 1 February 2005, or later approved revision (depending on which basket configuration is installed).

AERO Design Ltd., Maintenance Instructions MI606.01, Revision 2, dated 19 July 2004 is required with this installation.

External Attachment Provisions may remain installed if the basket installation is removed.

Basis of Certification remains as defined in the applicable Type Certificate Data Sheets.

(continued on page 2)



Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated will not adversely affect the airworthiness of the modified product.

D.S. Austen
For Minister of Transport



NOTE: THIS ADDENDUM SHALL REMAIN PART OF THE CERTIFICATE REFERRED TO THEREIN.

Bell 407 only: (Continued)

407 Configuration B – External Cargo Basket Low Mounted

Installation of Configuration A, External Attachment Provisions is a prerequisite for installation of Configuration B, External Cargo Basket Installation. Installation of the External Cargo Basket is to be completed in accordance with Transport Canada approved, AERO Design Ltd., Document Control List DCL606, Revision 1, dated 20 July 2004, or later approved revision. High skid gear is required for the basket installation. Placard is required on the basket lid.

Transport Canada approved, AERO Design Ltd., Flight Manual Supplement FMS 606.01, Revision 1, dated 01 February 2005, or later approved revision, is required with this installation.

AERO Design Ltd. Maintenance Instructions MI 606.01, Revision 2, dated 19 July 2004, or later Transport Canada accepted revision, is required with this installation.

Basis of Certification remains as defined in the applicable Type Certificate Data Sheets.

407 Configuration C – External Cargo Basket Installation High Mounted

Installation of Configuration A, External Attachment Provisions is a prerequisite for installation of Configuration C, External Cargo Basket Installation. Installation of the External Cargo Basket is to be completed in accordance with Transport Canada approved, AERO Design Ltd., Document Control List DCL606-1, Revision 0, dated 1 February 2005, or later approved revision. Approved emergency exit “push out” windows or an approved sliding door are required on the side of the helicopter that the basket is installed on if passengers are to be carried. Placard required on the basket lid.

Transport Canada approved AERO Design Ltd., Flight Manual Supplement FMS 606.01 Revision 1 dated 01 February 2005, or later approved revision, is required with this installation.

(continued on page 3)



NOTE: THIS ADDENDUM SHALL REMAIN PART OF THE CERTIFICATE REFERRED TO THEREIN.

Bell 407 only: (Continued)

407 Configuration C - External Cargo Basket Installation High Mounted (continued)

AERO Design Ltd., Maintenance Instructions MI606.01 Revision 2, dated 19 July 2004, or later accepted revision, are required with this installation.

Basis of Certification remains as defined in the applicable Type Certificate Data Sheets.

Bell 206L, L-1, L-3, L-4 only:

206L Series Configuration A - External Attachment Provisions Only:

Installation of the External Attachment Provisions is to be completed in accordance with Transport Canada approved, AERO Design Ltd., Document Control List DCL 493, Rev. 5, dated 20 July 2004, or later approved revision.

Transport Canada approved AERO Design Ltd. Flight Manual Supplement FMS 493.01, Revision 0, dated 19 May 2002, or later approved revision, is required with this installation.

AERO Design Ltd. Maintenance Instructions MI 493.01, Revision 2, dated 19 July 2004, or later Transport Canada accepted revision, is required with this installation.

External Attachment Provisions may remain installed if the basket installation is removed.

Basis of Certification is as defined in the Type Certificate Data Sheets for the Bell 407.

(continued on page 4)



NOTE: THIS ADDENDUM SHALL REMAIN PART OF THE CERTIFICATE REFERRED TO THEREIN.

Bell 206L, L-1, L-3, L-4 only: (continued)

206L Series Configuration B – External Cargo Basket Low Mounted:

Installation of Configuration A, External Attachment Provisions is a prerequisite for installation of Configuration B, External Cargo Basket installation. Installation of the cargo basket is to be completed in accordance with Transport Canada approved, AERO Design Ltd., Document Control List DCL492, Revision 4, dated 20 July 2004, or later approved revision. High skid gear is required for the basket installation. Placard is required on the basket lid.

Transport Canada approved AERO Design Ltd., Flight Manual Supplement FMS 492.01, Revision 1, dated 25 June 2002, or later approved revision, is required with this installation.

AERO Design Ltd. Maintenance Instructions MI 492.01, Revision 3, dated 19 July 2004, or later Transport Canada accepted revision, is required with this installation.

Basis of Certification is as defined in the Type Certificate Data Sheets for the Bell 407.

All Models (Bell 206L series and 407)

Auxiliary Step Installation:

Installation of the Auxiliary Step is to be completed in accordance with Transport Canada approved, AERO Design Ltd., Document Control List DCL623, Revision 0, dated 13 Jan 2005, or later approved revision.

(continued on page 5)



NOTE: THIS ADDENDUM SHALL REMAIN PART OF THE CERTIFICATE REFERRED TO THEREIN.

All Models (Bell 206L series and 407) (continued)

Auxiliary Step Installation: (continued)


The auxiliary step is optional and is not required with installation of Configuration B or C.

Auxiliary Step installed in accordance with DCL623 may remain installed if the basket installation is removed.

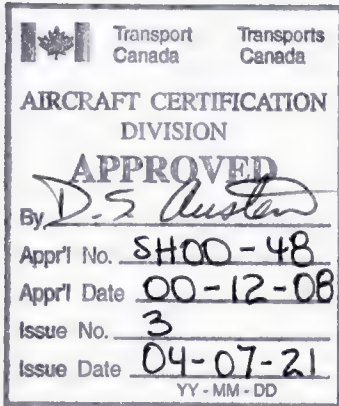
Basis of Certification is as defined in the Type Certificate Data Sheets for the Bell 407 (Bell 407 cert basis used for 206L series).

-End-

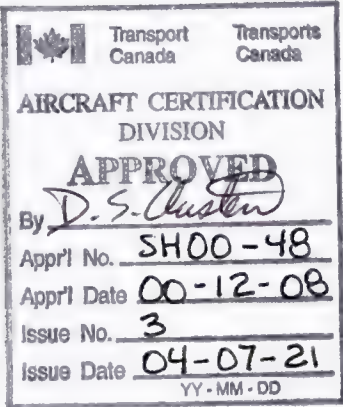
DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
60601	Cargo Basket Installation	0
60602	External Attachment Provisions Installation	0
FMS606.01	Flight Manual Supplement	0
MI606.01	Maintenance Instructions	2
FABRICATION DOCUMENTS		
60620	Block Fabrication	0
60621	Forward Fitting Fabrication	0
60622	Barrel Nut Fabrication	0
60624	Barrel Nut Fabrication	0
49205	Cargo Basket Assembly	1
49207	Cargo Basket Lid	1
49208	Cargo Basket Body	1
49209	End Hoop Assembly	1
49210	Basket Components – Hoops	1
49211	Basket Components – Rim	1
49212	Basket Components – Rim	0
49213	Basket Components – Lid Brace	1
49214	Basket Components – Spine	0
49215	Basket Components – Spacer	0
49216	Basket Components – Spacer	0
49217	Basket Components – Lug	1
49218	Placard	1
49219	Spacer	0
49221	Support Beams	1
36255	Handle Assembly	1
36261	Handle Bar Assembly	1
36262	Handle Bracket Assembly	1
36271	Handle Lever	0
36272	Basket Bracket	0
36273	Lid Bracket	0
36274	Bushing	0
36275	Bushing	1
36276	Spring Hook	0
36277	Handle Bar	0
36278	Spring	1
36280, Sheet 1	Brace	2
36280, Sheet 2	Brace	2
ENGINEERING DOCUMENTS		
ER606.01	Engineering Report – Basket Installation	0
ER606.02	Engineering Report – Load Test	0
ER492.01	Engineering Report – Basket Installation	0
ER492.02	Engineering Report – Basket Load Tests	0
ER493.01	Engineering Report – External Attachment Prov.	0
APPROVAL:		
 <div style="display: inline-block; vertical-align: top; margin-left: 10px;"> Transport Canada TRANSPORTS Canada </div> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> AIRCRAFT CERTIFICATION DIVISION <div style="text-align: center; font-weight: bold; font-size: 1.2em;">APPROVED</div> By <u><i>D. S. Austin</i></u> Appr'l No. <u>SH00-48</u> Appr'l Date <u>00-12-08</u> Issue No. <u>3</u> Issue Date <u>04-07-21</u> <small>YY-MM-DD</small> </div>		<div> ORIGINAL DATE: 31 May, 2004 REVISION DATE: 20 July, 2004 </div> <div style="text-align: center; margin-top: 20px;"> AERO DESIGN LTD. 2013 - 39th Avenue N.E. Calgary, Alberta T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333 </div>
<div style="display: flex; justify-content: space-between;"> <div> SHEET 1 OF 1 </div> <div style="text-align: center;"> BELL 407 Side-Mounted Cargo Basket Installation </div> </div>		Rev.
DCL606		1

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
49201	Cargo Basket Installation	1
FMS492.01	Flight Manual Supplement	1
MI492.01	Maintenance Instructions	3
FABRICATION DOCUMENTS		
49205	Cargo Basket Assembly	1
49207	Cargo Basket Lid	1
49208	Cargo Basket Body	1
49209	End Hoop Assembly	1
49210	Basket Components – Hoops	1
49211	Basket Components – Rim	1
49212	Basket Components – Rim	0
49213	Basket Components – Lid Brace	1
49214	Basket Components – Spine	0
49215	Basket Components – Spacer	0
49216	Basket Components – Spacer	0
49217	Basket Components – Lug	1
49218	Placard	1
49219	Spacer	0
49221	Support Beams	1
36255	Handle Assembly	1
36261	Handle Bar Assembly	1
36262	Handle Bracket Assembly	1
36271	Handle Lever	0
36272	Basket Bracket	0
36273	Lid Bracket	0
36274	Bushing	0
36275	Bushing	1
36276	Spring Hook	0
36277	Handle Bar	0
36278	Spring	1
36280, Sheet 1	Brace	2
36280, Sheet 2	Brace	2
ENGINEERING DOCUMENTS		
ER492.01	Engineering Report – Basket Installation	0
ER492.02	Engineering Report – Basket Load Tests	0
APPROVAL:		
 <p>AIRCRAFT CERTIFICATION DIVISION APPROVED By <u>D.S. Austin</u> Appr'l No. <u>SH00-48</u> Appr'l Date <u>00-12-08</u> Issue No. <u>3</u> Issue Date <u>04-07-21</u> YY-MM-DD</p>	ORIGINAL DATE: 17 May, 2002	AERO DESIGN LTD. 2013 – 39 th Ave. NE Calgary, Alberta T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333
	REVISION DATE: 20 July, 2004	
		SHEET 1 OF 1	BELL 206L SERIES Side-Mounted Cargo Basket Installation
DCL492		Rev. 4

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION	
INSTALLATION DOCUMENTS			
49301	External Attachment Provisions Installation	2	✓
FMS493.01	Flight Manual Supplement	0	✓
MI 493.01	Maintenance Instructions	2	✓
FABRICATION DOCUMENTS			
49311	Forward Fitting	0	
49312	Aft Fitting	0	
49311	Forward Fitting	2	
49312	Aft Fitting	2	
49319	Washer	0	
49320	Barrel Nut	0	
49320	Barrel Nut	1	
49321	Spacer	0	
ENGINEERING DOCUMENTS			
ER493.01	Engineering Report	0	
ER493.03	Test Report	0	
261.02	Honeycomb Insert Load Test Report	0	
APPROVAL: 		ORIGINAL DATE: 19 May, 2002 REVISION DATE: 20 July, 2004	AERO DESIGN LTD. 2013 - 39 th Avenue NE Calgary, Alberta T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333
SHEET 1 OF 1		BELL 206L SERIES External Attachment Provisions	
<h2 style="margin: 0;">DCL493</h2>		Rev.	<h2 style="margin: 0;">5</h2>

AERO Design Ltd.

**MAINTENANCE INSTRUCTIONS
MI 492.01**

Cargo Basket and External Attachment Provisions

Bell 206L Series Helicopters

STC # SH00-48

Prepared by: S. Fahey

Revision 3, 19 July, 2004

This Maintenance Instruction document has been completely revised (19 July, 2004) and is accepted by Transport Canada, superseding MI 492.01 Revision 3, (16 July, 2004).

AERO Design Ltd.: Mailing Address: 2013 – 39th Avenue N E, Calgary Alberta T2E 6R7
Telephone: (403) 250-8027; Facsimile: (403) 250-8333
E-Mail: aerodesign@telusplanet.net

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1.0 INTRODUCTION

The Cargo Basket mounts to the side of the Bell 206L Series helicopters, supported by two beams bolted to the External Attachment Provisions that replace the landing gear fittings. The Cargo Basket may face the Right or Left side of the helicopter.

2.0 DESCRIPTION

The Cargo Basket is installed on the Bell 206L helicopters in accordance with Installation Drawing 49201. The appropriate beams are bolted to the External Attachment Provisions with AN6 bolts (Figure 2.1), secured with barrel nuts inside the fittings.

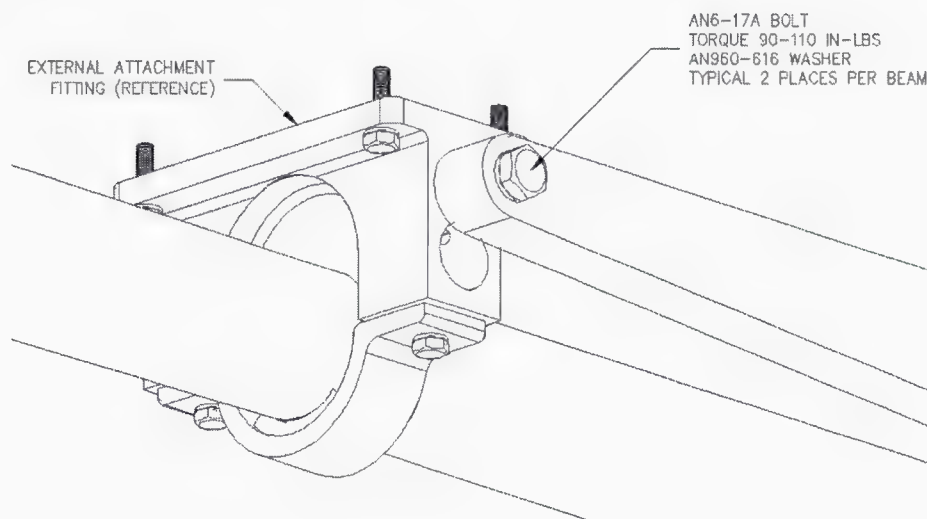


Figure 2.1 Attachment of Beam to Provisions

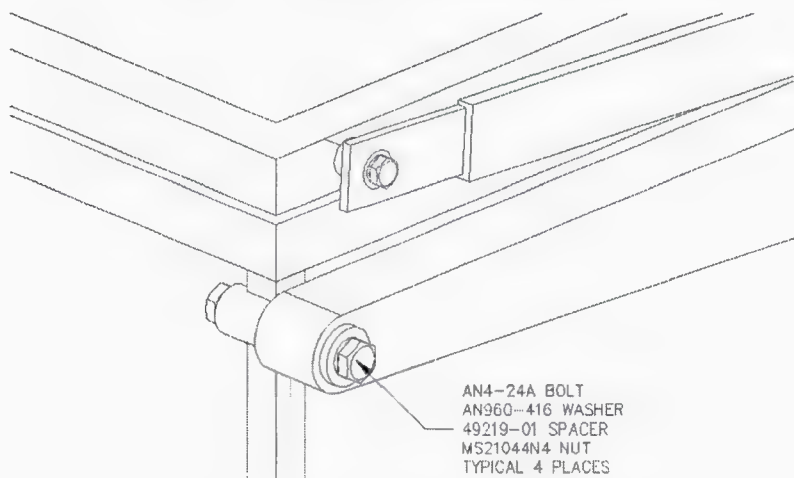


Figure 2.2 Attachment of Basket to Beam

The Basket is bolted to the beams with AN4 bolts (Figure 2.2).

Installation shall be performed to the standards described in AC43.13-1B, Chapter 7, Aircraft Hardware, Control Cables, and Turnbuckles.

Removal of the Cargo Basket is the reverse of the installation. The rotorcraft may be flown without the Cargo Basket and only the External Attachment Provisions installed.

See the Rotorcraft Maintenance Manual and Maintenance Instructions MI 493.01 for more information on the removal and installation of the landing gear fittings.

3.0 INSPECTION PROCEDURES

3.1 Basket

- Visually inspect tube-to-tube welds and mesh- to-tube welds every 100 hours for cracks, corrosion or other damage.
- Visually inspect basket mesh for damage every 100 hours.

3.2 Beams

- Visually inspect beams attaching basket to the helicopter every 100 hours in situ for cracks, corrosion or other damage.
- Visually inspect bolts attaching the basket to the beams every 100 in situ hours for security and damage.
- Visually inspect bolts attaching beams to external attachment provisions every 100 hours in situ for security and damage.

3.3 External Attachment Provisions

See Maintenance Instructions MI 493.01 for information on the inspection of the External Attachment Provisions.

4.0 REPAIR PROCEDURES

4.1 Basket

Repair Basket in accordance with AC43.13-1B, Chapter 4, Section 5, Welding, as required, where mesh-to-tube or tube-to-tube welds have come apart.

Basket is fabricated from the following materials:

- Lid and Rim: 3/4" x 0.035" square 4130 steel tube
- Frames: 1/2" x 0.035" square 4130 steel tube
- Mesh: 3/4" 18 ga. (0.040") expanded carbon steel mesh

Touch up with epoxy paint as required following repairs.

4.2 Beams

DO NOT REPAIR DAMAGE TO BEAMS IF BEYOND THE LIMITS BELOW.

- (a) Nicks and/or gouges on the top or bottom face up to 0.030" deep and 0.125" wide may be dressed out to a smooth contour.
- (b) Nicks and/or gouges on the side faces up to 0.060" deep and 0.125" wide may be dressed out to a smooth contour.
- (c) Nicks on the corners up to 0.125" deep may be dressed out.
- (d) For elongation of basket attachment holes (AN4 bolt):
 - 1. Ream hole to 0.375 (+0.0005/-0.0000)
 - 2. Insert NAS76A4-100 bushing
- (e) For elongation of helicopter attachment holes (AN6 bolt):
 - 1. Ream hole to 0.5000 (+0.0005/-0.0000)
 - 2. Insert NAS76A6-100 bushing
- (f) Touch up paint as required following repairs.

4.3 Landing Gear Attachment Fittings

See Maintenance Instructions MI 493.01 for information on the repair of the External Attachment Provisions.

5.0 LIMITATIONS

No overhaul time limitations or airworthiness limitations are applicable to the Cargo Basket.

AERO Design Ltd.

**MAINTENANCE INSTRUCTIONS
MI 493.01**

External Attachment Provisions

Bell 206L Series Helicopters

STC # SH00-48

Prepared by: S. Fahey

Revision 2, 19 July, 2004

This Maintenance Instruction document has been completely revised (19 July, 2004) and is accepted by Transport Canada, superseding MI 493.01 Revision 1, (16 July, 2004).

AERO Design Ltd.: Mailing Address: 2013 – 39th Avenue N E, Calgary Alberta T2E 6R7
Telephone: (403) 250-8027; Facsimile: (403) 250-8333
E-Mail: aerodesign@telusplanet.net

NOTICE: This manual contains information and data which is proprietary to AERO DESIGN LTD. This manual, or any part thereof, may not be reproduced, copied, duplicated or used without the written consent of AERO Design Ltd.

1.0 INTRODUCTION

The existing fittings which mount the helicopter on the landing gear cross tubes are replaced. The new fittings incorporate provisions for attaching external equipment to the helicopter. The External Attachment Provisions are intended for installation of an External Cargo Basket to the side of the helicopter, however Transport Canada approval may be issued for installation of other equipment.

2.0 DESCRIPTION

The External Attachment Provisions are installed on the Bell 206L series helicopter in accordance with Installation Drawing 49301. Each fitting is bolted to the lower fuselage and landing gear with the same fasteners as used for the original fittings, as shown in Figure 2.1.

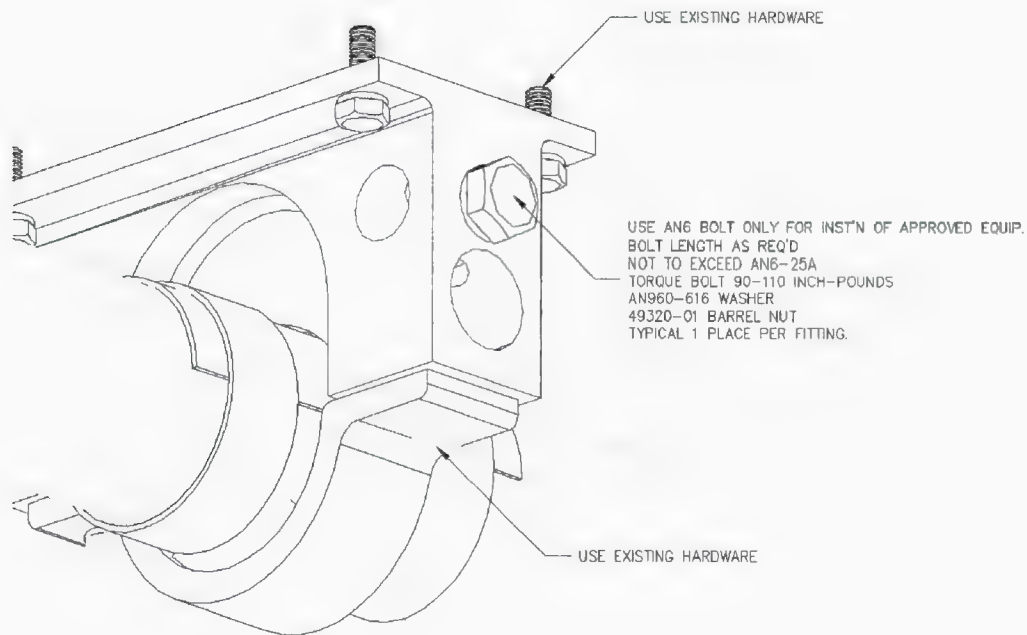


Figure 2.1 Installation of External Attachment Provisions

Installation shall be performed to the standards described in AC43.13-1B, Chapter 7, Aircraft Hardware, Control Cables, and Turnbuckles.

Removal of the External Attachment Provisions is the reverse of the installation. See the Rotorcraft Maintenance Manual for more information on the removal and installation of the landing gear fittings.

3.0 INSPECTION PROCEDURES

- Visually inspect fittings every 100 hours for cracks, corrosion or other damage.
- Visually inspect hardware attaching fittings and hardware attaching cross-tubes to fitting, every 100 hours in situ for security and damage.

4.0 REPAIR PROCEDURES

DO NOT REPAIR DAMAGE TO FITTINGS IF BEYOND THE LIMITS BELOW.

- (a) Nicks and/or gouges on any face up to 0.030" deep and 0.125" wide may be dressed out to a smooth contour. Touch up paint as required.
- (b) Do not repair elongation of provision bolt hole (AN6 bolt). Hole is nominally 0.391" in diameter with 1/4" maximum freedom of motion left and right.
- (c) Do not repair elongation of barrel nut hole. Hole is nominally 3/4" in diameter.

5.0 LIMITATIONS

No overhaul time limitations or airworthiness limitations are applicable to the External Attachment Provisions.



Transport
Canada

Transports
Canada

1100-9700 Jasper Avenue
Edmonton, Alberta T5J 4E6

Your file Votre référence

June 14, 2006

Our file Notre référence

C-06-0478

SH00-48

Aero Design Ltd.
2013 - 39th Avenue, N.E.
Calgary, Alberta
T2E 6R7

**SUBJECT: REVISION TO SUPPLEMENTAL TYPE CERTIFICATE NO. SH00-48 – ISSUE 5
DATED JUNE 9, 2006 – INSTALLATION OF CARGO BASKET/EXTERNAL
ATTACHMENT PROVISIONS/AUXILIARY STEP – BELL 206L, 206L-1,
206L-3, 206L-4, 407 – ISSUED TO AERO DESIGN LTD.**

This Supplemental Type Certificate (STC) is issued in response to your application. Included with the STC are the documents bearing the original Transport Canada signatures.

The transfer of this SH00-48 in the name of another person requires the prior approval from the Minister in accordance with Canadian Aviation Regulations (CAR) 513.25.

The requirements of AWM 561 apply where parts are manufactured and offered for sale. The provisions of CAR 571.06(4) should also be consulted.

A Canadian holder is required to report any service problem experienced with their product. Therefore, should you become aware of any defect, malfunction or failure resulting from the design change, it is your responsibility to submit a Service Difficulty Report to Transport Canada in accordance with CAR V, Subpart 91.

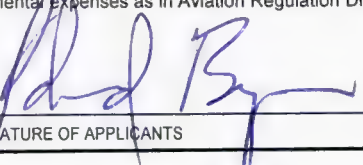

Yours truly,

J. Staal
Aircraft Certification Engineering Technologist
Prairie and Northern Region
Phone: (780) 495-5227
Fax: (780) 495-7963

Encl.


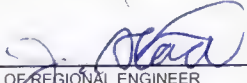
MODIFICATION APPROVAL REQUEST APPLICATION FORM

MOD698, R1

1. NAME AND ADDRESS OF APPLICANT:		2. IDENTIFICATION OF PRODUCT				
AERO Design Ltd. 2013 - 39th Avenue NE Calgary, Alberta T2E 6R7		MAKE: Bell		MODEL: 206L Series, 407		
ALL CORRESPONDANCE TO: AERO Design Ltd. 2013 - 39th Avenue NE Calgary, Alberta T2E 6R7		SERIAL No.: All Eligible		REGISTRATION: All Eligible		
3. REQUEST FOR:						
A. SUPPLEMENTAL TYPE CERTIFICATE (STC)		<input type="checkbox"/>				
B. STC/STA REVISION		<input checked="" type="checkbox"/> STC/STA No. SH00-48				
C. LIMITED SUPPLEMENTAL TYPE CERTIFICATE (LSTC)		<input type="checkbox"/>				
D. LIMITED STC/STA REVISION		<input type="checkbox"/> LSTC/LSTA No.				
E. F.A.A. SUPPLEMENTAL TYPE CERTIFICATE		<input type="checkbox"/>				
F. F.A.A. STC REVISION		<input type="checkbox"/> STC No.				
G. FAMILIARIZATION OF F.A.A. STC		<input type="checkbox"/> STC No.				
H. REPAIR DESIGN APPROVAL (RDC)		<input type="checkbox"/>				
I. PARTS DESIGN APPROVAL (PDA)		<input type="checkbox"/>				
4. TITLE OF MODIFICATION OR REPAIR: Quick Release Cargo Basket Installation						
5. BRIEF DESCRIPTION OF MODIFICATION OR REPAIR: Installation of a cargo basket that does not require tools so as to allow a pilot to install or remove the basket in the field without support from an AME. Minor updates to the remainder of the approval are also included.						
6. APPLICABLE TYPE APPROVAL (TA) OR TYPE CERTIFICATE (TC) DOCUMENTS:						
A. TA NO. H-92 B. TC No. C. OTHER						
7. PROPOSED BASIS OF APPROVAL:						
A. SAME AS TA <input checked="" type="checkbox"/> B. SAME AS TC <input type="checkbox"/> C. OTHER <input type="checkbox"/> (Please specify)						
8. DOCUMENTATION CHECKLIST		REQUIRED		FOR DOT USE ONLY		
				RECEIVED		
		YES	NO	YES	NO	DATE
COMPLIANCE PROGRAM		X				
MASTER DRAWING LIST		X				
FLIGHT MANUAL SUPPLEMENT		X				
MAINTENANCE MANUAL SUPPLEMENT			X			
INSTRUCTIONS FOR CONTINUING AIRWORTHINESS		X				
ENGINEERING REPORTS		X				
DESIGN DRAWINGS			X			
MANUFACTURE DRAWINGS & INSTALLATION INSTRUCTIONS		X				
ELECTRICAL LOAD ANALYSIS			X			
DRAFT STC, LSTC OR RDA			X			
WEIGHT AND MOMENT CHANGE		X				
FLIGHT TEST DATA		X				
OTHER (Specify)						
9. APPLICANT'S REMARKS:						
10. In addition to the payment of Aircraft Certification approval fees as prescribed in Canadian Aviation Regulations (CAR) Section 104, I agree to reimburse Transport Canada incremental expenses as in Aviation Regulation Directive No. 3, or equivalent, as applicable. For further details governing cost recovery, refer to AMA 513/4.						
PER: 		Consultant			27 April, 2006	
SIGNATURE OF APPLICANTS		TITLE			DATE	
11. 					2006 June 09	
SIGNATURE OF REGIONAL ENGINEER					DATE	

MODIFICATION APPROVAL REQUEST APPLICATION FORM

MOD606-1, Rev. 0

1. NAME AND ADDRESS OF APPLICANT: AERO Design Ltd. 2013 39th Ave NE Calgary, AB, T2E 6R7		2. IDENTIFICATION OF PRODUCT				
		MAKE: Bell	MODEL: 206L Series, 407			
ALL CORRESPONDANCE TO: AERO Design Ltd. 2013 39th Ave N.E. Calgary, AB T2E 6R7		SERIAL No.: All Eligible	REGISTRATION: All Eligible			
3. REQUEST FOR:						
A. SUPPLEMENTAL TYPE CERTIFICATE (STC)		<input type="checkbox"/>				
B. STC/STA REVISION		<input checked="" type="checkbox"/>	STC/STA No. SH00-48			
C. LIMITED SUPPLEMENTAL TYPE CERTIFICATE (LSTC)		<input type="checkbox"/>				
D. LIMITED STC/STA REVISION		<input type="checkbox"/>	LSTC/LSTA No.			
E. F.A.A. SUPPLEMENTAL TYPE CERTIFICATE		<input type="checkbox"/>				
F. F.A.A. STC REVISION		<input type="checkbox"/>	STC No.			
G. FAMILIARIZATION OF F.A.A. STC		<input type="checkbox"/>	STC No.			
H. REPAIR DESIGN APPROVAL (RDC)		<input type="checkbox"/>				
I. PARTS DESIGN APPROVAL (PDA)		<input type="checkbox"/>				
4. TITLE OF MODIFICATION OR REPAIR: Side Mounted Cargo Basket Installation						
5. BRIEF DESCRIPTION OF MODIFICATION OR REPAIR: This revision is to include two changes to the approval: 1) New configuration for mounting the cargo basket above the beams (normally used for operations in snow) (see PS606 Revision 1). 2) An optional installation of an auxilliary step to allow easier access to the forward doors (See PS 623, Revision 0).						
6. APPLICABLE TYPE APPROVAL (TA) OR TYPE CERTIFICATE (TC) DOCUMENTS:						
A. TA NO. H-92 B. TC No. C. OTHER						
7. PROPOSED BASIS OF APPROVAL:						
A. SAME AS TA <input checked="" type="checkbox"/> B. SAME AS TC <input type="checkbox"/> C. OTHER <input type="checkbox"/> (Please specify)						
8. DOCUMENTATION CHECKLIST		REQUIRED		FOR DOT USE ONLY		
				RECEIVED		
		YES	NO	YES	NO	DATE
COMPLIANCE PROGRAM		X				
MASTER DRAWING LIST		X				
FLIGHT MANUAL SUPPLEMENT		X				
MAINTENANCE MANUAL SUPPLEMENT			X			
INSTRUCTIONS FOR CONTINUING AIRWORTHINESS		X				
ENGINEERING REPORTS			X			
DESIGN DRAWINGS			X			
MANUFACTURE DRAWINGS & INSTALLATION INSTRUCTIONS		X				
ELECTRICAL LOAD ANALYSIS			X			
DRAFT STC, LSTC OR RDA		X				
WEIGHT AND MOMENT CHANGE		X				
FLIGHT TEST DATA		X				
OTHER (Specify)						
9. APPLICANT'S REMARKS: Flight Manual Supplement and Instructions for continuing airworthiness are for basket only.						
10. In addition to the payment of Aircraft Certification approval fees as prescribed in Canadian Aviation Regulations (CAR) Section 104, I agree to reimburse Transport Canada incremental expenses as in Aviation Regulation Directive No. 3, or equivalent, as applicable. For further details governing cost recovery, refer to AMA 513/4.						
PER: 		Consultant		02 February, 2005		
SIGNATURE OF APPLICANTS		TITLE		DATE		
11. 						
SIGNATURE OF REGIONAL ENGINEER						
2005 MAR 04, DATE						



Transport
Canada

Transports
Canada

1100-9700 Jasper Avenue
Edmonton, Alberta T5J 4E6

July 26, 2004

Your file Votre référence

Our file Notre référence
C-02-0513
SH00-48

Aero Design Ltd.
2013 – 39 Avenue, N.E.
Calgary, Alberta
T2E 6R7

Dear Sir:

**SUBJECT: REVISION TO SUPPLEMENTAL TYPE CERTIFICATE NO. SH00-48 – ISSUE 3
DATED JULY 21, 2004 – INSTALLATION OF CARGO BASKET / EXTERNAL
ATTACHMENT PROVISIONS – BELL 206L, 206L-1, 206L-3, 206L-4, 407
ISSUED TO AERO DESIGN LTD.**

This Supplemental Type Certificate (STC) is issued in response to your application. Included with the STC are the documents bearing the original Transport Canada signatures.

The transfer of this STC in the name of another person requires the prior approval from the Minister in accordance with Canadian Aviation Regulations (CAR) 513.25.

The requirements of AWM 561 apply where parts are manufactured and offered for sale. The provisions of CAR 571.06(4) should also be consulted.

A Canadian holder is required to report any service problem experienced with their product. Therefore, should you become aware of any defect, malfunction or failure resulting from the design change, it is your responsibility to submit a Service Difficulty Report to Transport Canada in accordance with CAR V, Subpart 91.

Yours truly,

J. Staal
Aircraft Certification Engineering Technologist
Prairie and Northern Region
Phone: (780) 495-5227
Fax: (780) 495-7963

Encl.



Transport
Canada

Transports
Canada

1100-9700 Jasper Avenue
Edmonton, Alberta T5J 4E6

Your file Votre référence

April 18, 2005

Our file Notre référence
C-05-0194
SH00-48

Aero Design Ltd.
2013 – 39 Avenue, N.E.
Calgary, Alberta
T2E 6R7

Dear Sirs:

**SUBJECT: SUPPLEMENTAL TYPE CERTIFICATE NO. SH00-48 – ISSUE 4 DATED
APRIL 14, 2005 – INSTALLATION OF CARGO BASKET/EXTERNAL
ATTACHMENT PROVISIONS/OPTIONAL STEP – BELL 206L, 206L-1, 206L-3,
206L-4, 407 – ISSUED TO AERO DESIGN LTD.**

This Supplemental Type Certificate (STC) is issued in response to your application. Included with the STC are the documents bearing the original Transport Canada signatures.

The transfer of this STC in the name of another person requires the prior approval from the Minister in accordance with Canadian Aviation Regulations (CAR) 513.25.

The requirements of AWM 561 apply where parts are manufactured and offered for sale. The provisions of CAR 571.06(4) should also be consulted.

A Canadian holder is required to report any service problem experienced with their product. Therefore, should you become aware of any defect, malfunction or failure resulting from the design change, it is your responsibility to submit a Service Difficulty Report to Transport Canada in accordance with CAR V, Subpart 91.

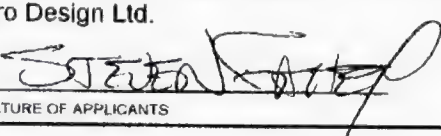
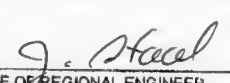
Yours truly,

J. Steal
Aircraft Certification Engineering Technologist
Prairie and Northern Region
Phone: (780) 495-5227
Fax: (780) 495-7963

Encl.

MODIFICATION APPROVAL REQUEST APPLICATION FORM

MOD492, Rev. 1

1. NAME AND ADDRESS OF APPLICANT: AERO Design Ltd. 1045 McTavish Rd. N.E. Calgary, AB, T2E 7G9		2. IDENTIFICATION OF PRODUCT				
ALL CORRESPONDANCE TO: AERO Design Ltd. 1045 McTavish Rd. N.E. Calgary, AB, T2E 7G9		MAKE: Bell	MODEL: 206L, 206L-1, 206L-3, 206L-4			
		SERIAL No.: All Applicable	REGISTRATION: All Applicable			
3. REQUEST FOR:						
A. SUPPLEMENTAL TYPE CERTIFICATE (STC)		<input type="checkbox"/>	C-02-0513			
B. STC/STA REVISION		<input checked="" type="checkbox"/>				
C. LIMITED SUPPLEMENTAL TYPE CERTIFICATE (LSTC)		<input type="checkbox"/>				
D. LIMITED STC/STA REVISION		<input type="checkbox"/>				
E. F.A.A. SUPPLEMENTAL TYPE CERTIFICATE		<input type="checkbox"/>				
F. F.A.A. STC REVISION		<input type="checkbox"/>				
G. FAMILIARIZATION OF F.A.A. STC		<input type="checkbox"/>				
H. REPAIR DESIGN APPROVAL (RDC)		<input type="checkbox"/>				
I. PARTS DESIGN APPROVAL (PDA)		<input type="checkbox"/>				
4. TITLE OF MODIFICATION OR REPAIR: Installation of Side-Mounted Cargo Basket						
5. BRIEF DESCRIPTION OF MODIFICATION OR REPAIR: Basket is approximately 74" long, 22" wide. Located below doors and between cross-tubes to the side of helicopter. Supported by beams mounted on external attachment provisions. Helicopter can be flown with provisions in place and basket removed (configuration A) or basket fully installed (configuration B).						
6. APPLICABLE TYPE APPROVAL (TA) OR TYPE CERTIFICATE (TC) DOCUMENTS:						
A. TA NO. H-92 B. TC No. H2SW C. OTHER						
7. PROPOSED BASIS OF APPROVAL:						
A. SAME AS TA <input type="checkbox"/> B. SAME AS TC <input checked="" type="checkbox"/> C. OTHER <input type="checkbox"/> (Please specify)						
8. DOCUMENTATION CHECKLIST		REQUIRED		FOR DOT USE ONLY		
		YES	NO	RECEIVED		
				YES	NO	DATE
COMPLIANCE PROGRAM		X		✓		
MASTER DRAWING LIST		X		✓		
FLIGHT MANUAL SUPPLEMENT		X		✓		
MAINTENANCE MANUAL SUPPLEMENT		X		✓		
INSTRUCTIONS FOR CONTINUING AIRWORTHINESS		X		✓		
ENGINEERING REPORTS		X		✓		
DESIGN DRAWINGS			X			
MANUFACTURE DRAWINGS & INSTALLATION INSTRUCTIONS		X		✓		
ELECTRICAL LOAD ANALYSIS			X			
DRAFT STC, LSTC OR RDA			X			
WEIGHT AND MOMENT CHANGE		X		✓		
FLIGHT TEST DATA		X		✓		
OTHER (Specify)						
9. APPLICANT'S REMARKS:						
10. In addition to the payment of Aircraft Certification approval fees as prescribed in Canadian Aviation Regulations (CAR) Section 104, I agree to reimburse Transport Canada incremental expenses as in Aviation Regulation Directive No. 3, or equivalent, as applicable. For further details governing cost recovery, refer to AMA 513/4.						
Aero Design Ltd.						
PER: 		For E. BURGON		12 July, 2002		
SIGNATURE OF APPLICANTS		Consultant		DATE		
		TITLE				
11.						
				2002 July 12.		
SIGNATURE OF REGIONAL ENGINEER				DATE		



Transport
Canada

Transports
Canada

1100-9700 Jasper Avenue
Edmonton, Alberta T5J 4E6

Your file Votre référence

Our file Notre référence

May 10, 2006

C-04-0661
SH00-48

Aero Design Ltd.
2013 39th Avenue North East
Calgary, Alberta
T2E 6R7

Dear Sirs :

SUBJECT:	Approval of	Installation of Cargo Basket / External Attachment Provisions.
	FAA STC:	SR02253NY
	Aircraft:	BELL 206L, 206L-1, 206L-3, 206L-4, 407
	FAA STC Holder:	Aero Design Ltd.

Enclosed is the original FAA Supplemental Type Certificate and information concerning your responsibility as a holder of a Supplemental Type Certificate SR02253NY issued to a Canadian Applicant.

This FAA STC is based on Issue 4 of Canadian Supplemental Type Certificate SH00-48.

Yours truly,

Debbie Dubyk
Operational Support Assistant
Aircraft Certification
Prairie and Northern Region
Phone: (780) 495-7412
Facs: (780) 495-7963

Encl.

**NEW ENGLAND REGION
NEW YORK AIRCRAFT CERTIFICATION OFFICE
1600 STEWART AVENUE, SUITE 410
WESTBURY, NEW YORK 11590**

**INFORMATION CONCERNING YOUR RESPONSIBILITY AS HOLDER OF A
SUPPLEMENTAL TYPE CERTIFICATE ISSUED TO A CANADIAN APPLICANT**

This STC is official indications of FAA approval of your installation and may be used to authorize identical installation on other aircraft of the same model, subject to the limitation noted in the STC. It may be transferred, or otherwise made available to another party by means of a licensee arrangement; however, you are requested to advise this office when you transfer or grant licensee rights to the STC in order that we may take the necessary recording or reissuance action.

If you plan to manufacture and sell parts for installation on type certificated aircraft, please review FAR 21.502, which is applicable to parts imported into the U.S.

A copy of the STC and required documents should accompany each kit and installation. Also, your attention is directed to the limitations and conditions specified in the STC.

As recipient of this approval, except as provided in FAR21.3(d), you are required to report any failure, malfunction, or defect in any product or part manufactured by you that you have determined has resulted or could result in any of the occurrences listed in FAR 21.3(c).

The report should be communicated initially by telephone and subsequently in writing to the Manager, New York Aircraft Certification Office, telephone (516) 228-7300, mailing address: 1600 Stewart Avenue, Suite 410, Westbury, New York 11590. This first contact should take place within 24 hours after it has been determined that the failure required to be reported has occurred.

FAA Form 8010-4, Malfunction or Defect Report, or any other appropriate format is acceptable in transmitting the required details.



Anthony Socias
Manager,
New York Aircraft Certification Office

NEW ENGLAND REGION
NEW YORK AIRCRAFT CERTIFICATION OFFICE
1600 STEWART AVENUE, SUITE 410
WESTBURY, NEW YORK 11590

INFORMATION CONCERNING YOUR RESPONSIBILITY AS HOLDER OF A
SUPPLEMENTAL TYPE CERTIFICATE ISSUED TO A CANADIAN APPLICANT

This STC is official indications of FAA approval of your installation and may be used to authorize identical installation on other aircraft of the same model, subject to the limitation noted in the STC. It may be transferred, or otherwise made available to another party by means of a licensee arrangement; however, you are requested to advise this office when you transfer or grant licensee rights to the STC in order that we may take the necessary recording or reissuance action.

If you plan to manufacture and sell parts for installation on type certificated aircraft, please review FAR 21.502, which is applicable to parts imported into the U.S.

A copy of the STC and required documents should accompany each kit and installation. Also, your attention is directed to the limitations and conditions specified in the STC.

As recipient of this approval, except as provided in FAR 21.3(d), you are required to report any failure, malfunction, or defect in any product or part manufactured by you that you have determined has resulted or could result in any of the occurrences listed in FAR 21.3(c).

The report should be communicated initially by telephone and subsequently in writing to the Manager, New York Aircraft Certification Office, telephone (516) 228-7300, mailing address: 1600 Stewart Avenue, Suite 410, Westbury, New York 11590. This first contact should take place within 24 hours after it has been determined that the failure required to be reported has occurred.

FAA Form 8010-4, Malfunction or Defect Report, or any other appropriate format is acceptable in transmitting the required details.



Anthony Socias
Manager,
New York Aircraft Certification Office

United States of America
Department of Transportation -- Federal Aviation Administration

Supplemental Type Certificate

IMPORT

Number SR02253NY

This certificate is issued to
Aero Design Ltd.
2013-39 Avenue, N.E.
Calgary, Alberta
Canada T2E 6R7

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part 27 of the Federal Aviation Regulations.

Original Product .. Type Certificate Number : *

*See attached FAA Approved Model List (AML) No. SR02253NY for the list of approved aircraft models and applicable airworthiness regulations.

Make : *

Model : *

Description of Type Design Change:

Installation of Cargo Basket/External Attachment Provisions/Optional Step

Limitations and Conditions:

1. Bell 407 only:

407 Configuration A - External Attachment Provisions Only:

Installation of the External Attachment Provisions is to be completed in accordance with Transport Canada approved, AERO Design Ltd., Document Control List DCL 606, Rev 1, dated 20 July 2004, or later Transport Canada approved revision, or Document Control List DCL 606-1, Revision 0, dated 1 February 2005, or later Transport Canada approved revision (depending on which basket configuration is installed).

(See continuation Sheets 2 and 3)

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application : August 9, 2004

Date reissued:

Date of issuance : April 19, 2006

Date amended:



By direction of the Administrator

Anthony Socias
(Signature)

Anthony Socias
Manager
New York Aircraft Certification Office

(Title)

Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both.

FAA Form 8110-2 (10-64)

Page 1 of 3

This certificate may be transferred in accordance with FAR 21.47.

United States of America
Department of Transportation -- Federal Aviation Administration

Supplemental Type Certificate

(Continuation Sheet)

Number SR02253NY

Date of Issuance: April 19, 2006

Limitations and Conditions (Continued):

AERO Design Ltd., Maintenance Instructions MI606.01, Revision 2, dated 19 July 2004 or later Transport Canada accepted revisions are required with this installation.

External Attachment Provisions may remain installed if the basket installation is removed.

Basis of Certification remains as defined in the applicable Type Certificate Data Sheets.

407 Configuration B – External Cargo Basket Low Mounted

Installation of Configuration A, External Attachment Provisions is a prerequisite for installation of Configuration B, External Cargo Basket Installation. Installation of the External Cargo Basket is to be completed in accordance with Transport Canada approved, AERO Design Ltd., Document Control List DCL606, Revision 1, dated 20 July 2004, or later Transport Canada approved revision. High skid gear is required for the basket installation. Placard is required on the basket lid.

Transport Canada approved, AERO Design Ltd., Flight Manual Supplement FMS 606.01, Revision 1, dated 1 February 2005, or later Transport Canada approved revision, is required with this installation.

AERO Design Ltd. Maintenance Instructions MI 606.01, Revision 2, dated 19 July 2004, or later Transport Canada accepted revision, is required with this installation.

Basis of Certification remains as defined in the applicable Type Certificate Data Sheets.

407 Configuration C – External Cargo Basket Installation High Mounted

Installation of Configuration A, External Attachment Provisions is a prerequisite for installation of Configuration C, External Cargo Basket Installation. Installation of the External Cargo Basket is to be completed in accordance with Transport Canada approved, AERO Design Ltd., Document Control List DCL606-1, Revision 0, dated 1 February 2005, or later Transport Canada approved revision. Approved emergency exit "push out" windows or an approved sliding door are required on the side of the helicopter that the basket is installed on if passengers are to be carried. Placard required on the basket lid.

Transport Canada approved AERO Design Ltd., Flight Manual Supplement FMS 606.01 Revision 1 dated 01 February 2005, or later Transport Canada approved revision, is required with this installation.

AERO Design Ltd., Maintenance Instructions MI606.01 Revision 2, dated 19 July 2004, or later Transport Canada accepted revisions are required with this installation.

Basis of Certification remains as defined in the applicable Type Certificate Data Sheets.

2. Bell 206L, L-1, L-3, L-4 only:

206L Series Configuration A – External Attachment Provisions Only:

Installation of the External Attachment Provisions is to be completed in accordance with Transport Canada approved, AERO Design Ltd., Document Control List DCL 493, Rev. 5, dated 20 July 2004, or later Transport Canada approved revision.

Transport Canada approved AERO Design Ltd. Flight Manual Supplement FMS 493.01, Revision 0, dated 19 May 2002, or later Transport Canada approved revision, is required with this installation.

(See Continuation Sheet 3 of 3)

Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both.
FAR Form 8110-2-1(10-59) Page 2 of 3 This certificate may be transferred in accordance with FAR 21.47.

United States of America
Department of Transportation -- Federal Aviation Administration

Supplemental Type Certificate
(Continuation Sheet)

Number SR02253NY

Date of Issuance: April 19, 2006

Limitations and Conditions (Continued).

AERO Design Ltd. Maintenance Instructions MI 493.01, Revision 2, dated 19 July 2004, or later Transport Canada accepted revision, is required with this installation.

External Attachment Provisions may remain installed if the basket installation is removed.

Basis of Certification is as defined in the Type Certificate Data Sheets for the Bell 407.

206L Series Configuration B – External Cargo Basket Low Mounted:

Installation of Configuration A, External Attachment Provisions is a prerequisite for installation of Configuration B, External Cargo Basket installation. Installation of the cargo basket is to be completed in accordance with Transport Canada approved, AERO Design Ltd., Document Control List DCL492, Revision 4, dated 20 July 2004, or later Transport Canada approved revision. High skid gear is required for the basket installation. Placard is required on the basket lid.

Transport Canada approved AERO Design Ltd., Flight Manual Supplement FMS 492.01, Revision 1, dated 25 June 2002, or later Transport Canada approved revision, is required with this installation.

AERO Design Ltd. Maintenance Instructions MI 492.01, Revision 3, dated 19 July 2004, or later Transport Canada accepted revision, is required with this installation.

Basis of Certification is as defined in the Type Certificate Data Sheets for the Bell 407.

3. All Models (Bell 206L series and 407)

Auxiliary Step Installation:

Installation of the Auxiliary Step is to be completed in accordance with Transport Canada approved, AERO Design Ltd., Document Control List DCL623, Revision 0, dated 13 Jan 2005, or later Transport Canada approved revision.

The auxiliary step is optional.

Auxiliary Step installed in accordance with DCL623 may remain installed if the basket installation is removed.

Basis of Certification is as defined in the Type Certificate Data Sheets for the Bell 407 (Bell 407 cert basis used for 206L series).

4. Compatibility of this design change with previously approved modifications must be determined by the installer.

5. If the holder agrees to permit another person to use this certificate to alter the product, the holder shall give the other person written evidence of that permission.

... END...

Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both.
FAA Form 8110-2-1(10-69) Page 3 of 3 This certificate may be transferred in accordance with FAR 21.47.

FAA APPROVED MODEL LIST (AML) NO. SR02253NY

INSTALLATION OF CARGO BASKET/EXTERNAL ATTACHMENT PROVISIONS/OPTIONAL STEP

Issue Date: April 19, 2006

MAKE	MODEL	CERTIFICATION BASIS			REQUIRED DOCUMENTATION		AML AMENDMENT DATE
		PART	REGULATION	TCDS	MAINTENANCE MANUAL SUPPLEMENT	FLIGHT MANUAL SUPPLEMENT	
Bell	206L, 206L-1, 206L-3, 206L-4	FAR 27	Federal Aviation	H2SW	For Configuration A: Aero Design Ltd. Maintenance Instructions MI 493.01, Revision 2, dated 19 July 2004 or later Transport Canada accepted revisions.	For Configuration A: Transport Canada Approved AERO Design Ltd. Flight Manual Supplement FMS 493.01 Revision 0 dated 19 May 2002 or later Transport Canada approved revisions	
	407	FAR 27		H2SW	For Config B: Aero Design Ltd. Maintenance Instructions MI 492.01, Revision 3, dated 19 July 2004 or later Transport Canada accepted revisions.	For Configuration B: Transport Canada Approved AERO Design Ltd. Flight Manual Supplement FMS 492.01 Revision 1 dated 25 June 2002 or later Transport Canada approved revisions	
					For Configuration A, B and C: Aero Design Ltd. Maintenance Instructions MI 606.01, Revision 2, dated 19 July 2004 or later Transport Canada accepted revisions.	For Configuration B and C: Transport Canada Approved AERO Design Ltd. Flight Manual Supplement FMS 606.01 Revision 1 dated 01 February 2005 or later Transport Canada approved revisions	

FAA Approved:

Anthony Socias

Manager, New York Aircraft Certification Office

15 April, 2005

Transport Canada
Aircraft Certification Division
11th Floor, Canada Place
9700 Jasper Avenue
Edmonton, Alberta
T5J 4E6

Attn: Jack Staal

Your File # : SH00-48

Our File # : 492/606

Re: Application For FAA Approval Of Bell Heli Cargo Basket SH00-48

Jack,

Please include the following documents with the package sent to you on 9 August 2004
to be forwarded to the proper FAA office for familiarization of this STC:

Compliance Program	CP606-1	Revision 0
Document Control List	DCL606-1	Revision 0
Flight Manual Supplement	FMS 606.01	Revision 1
Engineering Report	ER 606.03	Revision 0
Test Report	TR 606.04	Revision 0
Test Report	TR 606.05	Revision 0
Installation Drawing, 407 Basket High Mounted	60603	Revision 0
Fabrication Drawing	60630	Revision 0
Fabrication Drawing	60631	Revision 0
Fabrication Drawing	60632	Revision 0
Fabrication Drawing	60640	Revision 0
Fabrication Drawing	60641	Revision 0
Fabrication Drawing	60642	Revision 0
Fabrication Drawing	60643	Revision 0
Fabrication Drawing	60644	Revision 0
Fabrication Drawing	60646	Revision 0
Fabrication Drawing	60647	Revision 0
Fabrication Drawing	60648	Revision 0
Fabrication Drawing	60649	Revision 0

AERO DESIGN LTD.

2013 – 39 Avenue N.E., Calgary, Alberta, T2E 6R7

Tel: 403-250-8027

Fax: 403-250-8333

aerodesign@telusplanet.net

Auxilliary Step

Compliance Program

Document Control List

Engineering Report

Installation Drawing

Fabrication Drawing

CP623 Revision 0

DCL623 Revision 0

ER623.01 Revision 0

62301 Revision 0

62320 Revision 1

Please remove the following documents from the package sent to you on 9 August, 2004:

Compliance Program

Document Control List

CP362-01 Revision 4

DCL362 Revision 3

Flight Manual Supplement

Flight Manual Supplement

FMS 362.01 Revision 1

FMS 606.01 Revision 0

Installation Drawing

Fabrication Drawing

Fabrication Drawing

Fabrication Drawing

Fabrication Drawing

Fabrication Drawing

Fabrication Drawing

36201 Revision 2

36202, Sht. 1/3 Revision 1

36202, Sht. 2/3 Revision 1

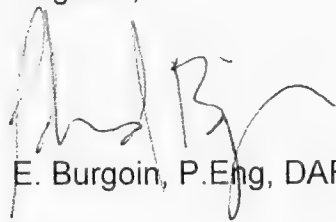
36202, Sht. 3/3 Revision 1

36203 Revision 2

36204 Revision 1

36210 Revision 1

Regards,



E. Burgoin, P.Eng, DAR 290M

Encl.

AERO DESIGN LTD.

2013 – 39th Ave N. E., Calgary, Alberta, T2E 6R7

aerodesign@telusplanet.net

F A X C O V E R S H E E T

DATE: June 14, 2006

TIME: 11:04 AM

TO: **Lance**

PHONE: (604) 514-4342

Pacific Airplane

FAX: (604) 514-4352

FROM: S. Fahey
Aero Design Ltd.

PHONE: 403-250-8027

FAX: 403-250-8333

Number of pages including cover sheet: 5

FAXED
11:13

RE: FAA STC FOR CARGO BASKET

Lance,

The FAA STC covers the low-mounted basket, with the aluminum beam bolted-mount.

Steve

LANCE
PACIFIC
(604)-514-4342
2061-3
~~FAA~~ Low mount
FAA STC
(604) 514-4352

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
60601 FMS606.01 ICA492.90	Cargo Basket Installation Flight Manual Supplement Instructions for Continued Airworthiness	1 1 0
FAERICATION DOCUMENTS		
DCL492-1	Document Control List for Side-Mounted Cargo Basket Assembly	0
ENGINEERING DOCUMENTS		
ER606.01 ER606.02	Engineering Report - Basket Installation Engineering Report - Load Test	0 0
<div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="width: 30%;"> <p>APPROVAL:</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <div style="text-align: right;"> <p>TRANSPORT CANADA</p> <p>AIRCRAFT CERTIFICATION DIVISION</p> <p>APPROVED</p> <p>By <i>[Signature]</i></p> <p>Appr'l No. <u>SH00-48</u></p> <p>Appr'l Date <u>00-12-08</u></p> <p>Issue No. <u>5</u></p> <p>Issue Date <u>06-06-09</u></p> <p style="font-size: small;">YY-MM-DD</p> </div> </div> </div> <div style="width: 35%;"> <p>ORIGINAL DATE: 31 May, 2004</p> <p>REVISION DATE: 10 May, 2006</p> </div> <div style="width: 35%; text-align: center;"> <p>AERO DESIGN LTD.</p> <p>2013 - 39th Avenue N.E. Calgary, Alberta T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333</p> </div> </div>		
SHEET 1 OF 1		<p>BELL 407</p> <p>Side-Mounted Cargo Basket Installation</p>
DCL606		<p>Rev.</p> <p style="font-size: 2em; font-weight: bold;">2</p>

FORM AE-100

DEPARTMENT OF TRANSPORT STATEMENT OF COMPLIANCE OF AIRCRAFT OR AIRCRAFT COMPONENTS WITH THE AIRWORTHINESS REQUIREMENTS		AE-100 No.: AE606 Initial Issue Date: 6 July, 2004 Revision: 1 Revision Date: 25 May, 2006 Approval No.: SH00-48 Delegation No.: 290M Delegate Name: E. Burgoin Classification of Designee: Employer: AERO Design Ltd.	
Aircraft Mfrg: Bell Aircraft Model: 407 Registration: All Eligible		Model Type Airplane <input type="checkbox"/> Helicopter <input checked="" type="checkbox"/> Appliance <input type="checkbox"/> Component <input type="checkbox"/>	
LIST OF APPROVED REPORTS AND DATA			
Document Number		Document Title	Compliance Status
DCL606 DCL492-1 60601	Revision 2 Revision 0 Revision 1	Document Control List and all documents referred to therein Document Control List for Basket Fabrication Cargo Basket Installation	
		DATA APPROVED BY TRANSPORT CANADA	
ICA492.90	Revision 0	Instructions for Continued Airworthiness	
CERTIFICATION			
UNDER THE AUTHORITY VESTED IN ME BY THE DEPARTMENT OF TRANSPORT, I HEREBY CERTIFY THAT THE DATA LISTED ABOVE AND ON THE ATTACHED SHEETS NUMBERED Nil HAVE BEEN EXAMINED IN ACCORDANCE WITH ESTABLISHED PROCEDURES AND FOUND TO COMPLY, TO THE BEST OF MY KNOWLEDGE AND BELIEF WITH THE PERTINENT COMPLIANCE REQUIRMENTS.			
I THEREFORE <input type="checkbox"/> RECOMMEND FOR APPROVAL OF THESE DATA <input checked="" type="checkbox"/> APPROVE THESE DATA			
 E. Burgoin, DAR 290M			

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS 60601 FMS606.01 ICA492.90	Cargo Basket Installation Flight Manual Supplement Instructions for Continued Airworthiness	1 1 0
FABRICATION DOCUMENTS DCL492-1	Document Control List for Side-Mounted Cargo Basket Assembly	0
ENGINEERING DOCUMENTS ER606.01 ER606.02	Engineering Report – Basket Installation Engineering Report – Load Test	0 0
APPROVAL:	ORIGINAL DATE: 31 May, 2004 REVISION DATE: 10 May, 2006	AERO DESIGN LTD. 2013 - 39 th Avenue N.E. Calgary, Alberta T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333
	SHEET 1 OF 1	BELL 407 Side-Mounted Cargo Basket Installation
	DCL606	Rev. 2

BELL 407

ROTORCRAFT FLIGHT MANUAL SUPPLEMENT for the INSTALLATION of the AERO DESIGN CARGO BASKET

Supplemental Type Certificate No. SH00-48

Sections I, II, III and IV of this document comprise the Transport Canada Approved sections of this Flight Manual Supplement. Compliance with Section I, Limitations, is mandatory.

Section V and any subsequent sections if present are Unapproved and are provided for information only.

The information and data contained in this Flight Manual Supplement supersede or supplement that contained in the basic Approved Flight Manual for the Bell 407 when fitted with the Cargo Basket. For limitations, procedures and performance not listed in this Flight Manual Supplement, refer to the Approved Flight Manual and other approved Flight Manual Supplements.



Table of Contents

I	Limitations	3
II	Normal Procedures	3
III	Emergency Procedures	3
IV	Performance	4
V	Weight and Balance	5

I LIMITATIONS

1. The maximum load in the AERO Design Ltd. Cargo Basket is 200 Lb. (90.9 kg).
2. Flight operations limited to VFR conditions with AERO Design Ltd. Cargo Basket installed.
3. Maximum lateral or rearward speed limited to 25 KIAS.
4. Maximum winds from aft quadrants limited to 25 KIAS for takeoff, landing or hover flight.
5. V_{NE} is 140 KIAS except when the V_{NE} of the basic rotorcraft is more restrictive, in which case the lower V_{NE} applies.

II NORMAL PROCEDURES

1. Pre-flight inspections:
 - a) Ensure that all cargo stored in the cargo basket does not extend outside the basket, is properly tied down and secured for flight.
 - b) Ensure that the lid of cargo basket is closed and secured.

CAUTION

It is possible to exceed the lateral centre of gravity limits of the rotorcraft under some loading conditions. Pilots must ensure that lateral C of G is within limits when loading the basket.

III EMERGENCY PROCEDURES

No change from basic Approved Flight Manual.

CAUTION:

The rotorcraft glide angle is steeper than that of the basic helicopter when the AERO Design Ltd. Cargo Basket is installed.

IV PERFORMANCE

Climb performance may be reduced by up to 200 fpm.

Cruise speeds are reduced by approximately 10 kts. (11 mph).

V WEIGHT AND BALANCE

English Units

Item	Weight (Lb)	Longitudinal		Lateral	
		Arm (in)	Moment (in*Lb)	Arm (in)	Moment (in*Lb)
Cargo Basket Installation	66.0	113.3	7476	30.5	2013
Cargo	200 (MAX)	114.1	22820	38.5	7700

Metric Units

Item	Weight (Kg)	Longitudinal		Lateral	
		Arm (mm)	Moment (mm*Kg)	Arm (mm)	Moment (mm*Kg)
Cargo Basket Installation	30,0	2878	86 314	775	23 241
Cargo	90.9 (MAX)	2898	263 467	978	88 900

Longitudinal and Lateral moment arms are given only for the center of the Cargo Basket. Due to the length of the basket, some loading arrangements may require that actual moment arms be measured, to determine the correct moments about the center of gravity.

CAUTION:

It is possible to exceed lateral CG limits in some configurations. For example, with one pilot, no passengers, fuel tanks half empty, and the AERO Design Ltd. cargo basket loaded with 200 pounds of cargo, the Lateral CG of the rotorcraft could be out of limits.

Aero Design

From: "Staal, Jack" <STAALJ@tc.gc.ca>
To: "Steve Fahey (E-mail)" <steve.aerodesign@telusplanet.net>
Sent: April 14, 2005 9:52 AM
Subject: C-05-0194, Cargo Baskets, SH00-48 reissue

Hi Steve,

The STC SH00-48 reissue for the cargo basket has been signed.

We have a corresponding file open C-04-0661 for the FAA application of last year. Are you going to freshen up the data for that file and I can then submit to the FAA?

J.H. (Jack) Staal

Aircraft Certification Technologist | Technologue, Certification des aeronefs.
Prairie and Northern Region | Region des Prairies et du Nord

Telephone | telephone: (780)495-5227
Facsimilie | telecopier: (780)495-7963
Email | courriel: staalj@tc.gc.ca
TTY / ATS : 1-888-675-6863

Transport Canada | Transports Canada
1100- 9700, Jasper Avenue | avenue Jasper (RAED)
Edmonton, AB T5J 4E6
Government of Canada | Gouvernement du Canada

14/04/2005

AERO DESIGN LTD.

2013 – 39 Avenue N.E., Calgary, Alberta, T2E 6R7

Tel: 403-250-8027

Fax: 403-250-8333

info@aerodesign.ca

13 April, 2006

Ft. Worth Aircraft Evaluation Group
Flight Standards District Office
Ft. Worth, TX
76193-0270

Attention: Fred Dryden

Re: Cargo Basket Installation on Bell 206L series and 407 Cdn. STC Familiarization

CC: Jack Staal, Transport Canada, Edmonton, AB

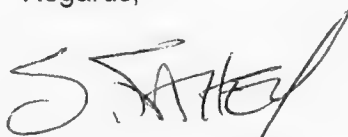
Fred,

I have enclosed two sets of the following drawings to help you review the application:

Bell 407	Cargo Basket	Drawing 60601	Revision 0
Bell 407	External Attachment Provisions	Drawing 60602	Revision 0
Bell 407	Cargo Basket (High-Mounted)	Drawing 60603	Revision 0
Bell 206L	Cargo Basket	Drawing 49201	Revision 1
Bell 206L	External Attachment Provisions	Drawing 49301	Revision 2
Bell 407 & 206L	Auxiliary Step	Drawing 62301	Revision 0

I hope this helps.

Regards,



Steven Fahey, CET

Encl.

Ted Burgoin

From: "Staal, Jack" <STAALJ@tc.gc.ca>
To: "Aerodesign (E-mail)" <aerodesign@telusplanet.net>; "Steve Fahey (E-mail)" <steve.aerodesign@telusplanet.net>
Cc: "Dan Parrillo (E-mail)" <Daniel.Parrillo@faa.gov>
Sent: Friday, April 07, 2006 3:17 PM
Subject: FW: STCs for Bell 206's and 407's - FAA Project No. ST5297NY-R

Hi Steve, Ted,

Reference STC SH00-48 Issue 4, and the corresponding FAA STC application file.

Would you mind sending the FAA AEG in Ft. Worth a copy of the installation drawings. See FAA email below for FAA Ft. Worth AEG address and contact person.

The DCL's list the following installation drawings.

DCL606 Rev 1 Drawing 60601 Rev 0 (407 Low Basket)
 DCL606-1 Rev 0 Drawing 60603 Rev 0 (407 High Mount)
 Drawing 60602 Rev 0 (407 External attach provisions)
 DCL492 Rev 4 Drawing 49201 Rev 1 (206L Basket)
 DCL493 Rev 5 Drawing 49301 Rev 2 (206L Attachment provisions)
 DCL623 Rev 0 Drawing 62301 Rev 0 (Aux Step 206L & 407)

Regards,

J.H. (Jack) Staal

Aircraft Certification Technologist | Technologue, Certification des aeronefs.
 Prairie and Northern Region | Region des Prairies et du Nord

Telephone | telephone: (780)495-5227
 Facsimilie | telecopier: (780)495-7963
 Email | courriel: staalj@tc.gc.ca
 TTY / ATS : 1-888-675-6863

Transport Canada | Transports Canada
 1100- 9700, Jasper Avenue | avenue Jasper (RAED)
 Edmonton, AB T5J 4E6
 Government of Canada | Gouvernement du Canada

-----Original Message-----

From: Daniel.Parrillo@faa.gov [mailto:Daniel.Parrillo@faa.gov]
 Sent: Friday, April 07, 2006 5:25 AM
 To: Staal, Jack
 Cc: Fred.E.Dryden@faa.gov
 Subject: RE: STCs for Bell 206's and 407's - FAA Project No. ST5297NY-R

4/10/2006

Jack:

An additional request.

Although, I have copies of the installation drawings, I do not have the ability to replicate them. The AEG has asked for a set.
Can you have the applicant send a copy of the installation drawings for this project to:

Fred Dryden
Ft. Worth Aircraft Evaluation Group
Flight Standards District Office
Ft. Worth , TX 76193-0270

Thanks,

Dan

"Staal, Jack"
<STAALJ@tc.gc.ca>

03/27/2006 10:41 AM To
Daniel Parrillo/AEA/FAA@FAA
cc

Subject
RE: STCs for Bell 206's and 407's -
FAA Project No. ST5297NY-R

Dan,

I faxed a copy of the letter a few minutes ago. Let me know if you did not receive it.

Cheers,

4/10/2006

AERO Design Ltd.

REFERENCE

ENGINEERING REPORT ER492.01

Side-Mounted Cargo Basket

Bell 206 L Series

Attachment of Basket Installation to Fuselage

Approved: E. Burgoin, P. Eng.

Prepared: S. Fahey

Date: 09 May, 2002
Revision 0

AERO Design Ltd.: Mailing Address: 1045 McTavish Road N E, Calgary Alberta T2E 7G9
Telephone: (403) 250-8027; Facsimile: (403) 250-8333
E-Mail: aerodsgn@telusplanet.net

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1.0 INTRODUCTION

Operators of the 206L helicopter find that it is an advantage to have more cargo area in their helicopters. This cargo basket is an improved solution to the problem of cargo space than cargo baskets in the past: it carries more weight, and is less obtrusive than other cargo baskets. By employing the Aero Design Ltd. External Attachment Provisions, it is much simpler and quicker to install and remove than competing baskets.

This report documents the strength of the basket installation's attachment to the External Attachment Provisions on the fuselage.

2.0 REFERENCE

Aero Design Ltd. Drawings 49201 through 49220.

Mil-Hdbk-5H

Aero Design Ltd. Engineering Report ER492.02

Aero Design Ltd. Engineering Report ER493.01

3.0 BASIS OF CERTIFICATION

To be applicable to all models of the 206L series, the certification basis of the 206L-4 is used:

Bell 206L-4

Canadian Type Approval

H-92

FAA Type Certificate

H2SW

FAR Part 27 dated 2 October 1964 Amendment 27-1 through 27-24 with:

27.79, 27.143, 27.173, 27.175, 27.1519, 27.1585, 27.1587 at Amdt 27-1;

27.1093, 27.1545 at Amdt 27-8;

27.45, 27.141, 27.1309 at Amdt 27-20;

27.2, 27.307, 27.337, 27.351, 27.427, 27.501, 27.571, 27.613, 27.629, 27.663, 27.674, 27.685, 27.727, 27.783, 27.807, 27.861, 27.865 at Amdt 27-28;

and 27.391, 27.395, 27.397, 27.681, 27.1357, 27.1361, replaced by 6.220, 6.225, 6.323, 6.623, 6.624, 6.625, 6.626 of CAR Part 6 dated 6 December 1956 Amendment 6-1 through 6-4.

Exceptions to FAR 27 are the deletion of: 27.71, 27.177, 27.399, 27.562, 27.610, 27.954, 27.1195, 27.1322.

Equivalent Safety Findings:

1. Skid Landing Gear (Drop Test) FAR 27.723, 27.725, and 27.727
2. Fuel Tanks (Drop Test)- FAR 27.965(c)(1) and (c)(2). FAR Part 36 dated 3 November 1969 Amendment 36-1 through 36-14, Subpart H.

4.0 ANALYSIS OF CURRENT AIRWORTHINESS DIRECTIVES (AD'S)

Airworthiness Directives applicable to the Bell 206L series have been reviewed and no conflicting AD's were found. See Appendix A.

AD's CF-95-17 and CF-98-43 refer to cracking of the landing gear cross-tubes, found particularly around riveted connections at the saddles, and at the fuselage mounting points. The basket is not mounted to the cross tubes.

The basket installation is unaffected by these AD's.

5.0 LOADS

Tests of the basket itself have been carried out and documented in Test Report ER492.02. Loads on the basket will be broken down into the critical loads on the beams supporting it.

5.1 Inertia Load Factors

BELL 206L4 HELICOPTER LOAD FACTORS, FAR 27:

FAR 27.561(b)(3)

	Ultimate Upward Emergency Landing Load Factor:	$n_{e_up} := 1.5$
	Ultimate Forward Emergency Landing Load Factor:	$n_{e_fwd} := 4.0$
	Ultimate Sideward Emergency Landing Load Factor:	$n_{e_side} := 2.0$
	Ultimate Downward Emergency Landing Load Factor:	$n_{e_down} := 4.0$
FAR 27.625	Fitting Factor:	$n_{ff} := 1.15$
FAR 27.303	Safety Factor:	$n_{sf} := 1.5$
FAR 27.337(a)	Limit Positive Manouvering LoadFactor:	$n_{man} := 3.5$
$n_{man_ult} := n_{man} \cdot n_{sf}$	Ultimate Positive Manouvering LoadFactor:	$n_{man_ult} = 5.25$
	Limit Negative Manouvering LoadFactor:	$n_{man_n} := -1.0$
$n_{man_neg_u} := n_{man_n} \cdot n_{sf}$	Ultimate Negative Manouvering LoadFactor:	$n_{man_neg_u} = -1.5$

CRITICAL ULTIMATE LOAD FACTORS:

Downward:	Ultimate Positive Manouvering LoadFactor:	$n_{man_ult} = 5.25$
Forward:	Ultimate Forward Emergency Landing Load Factor:	$n_{e_fwd} = 4.00$
Sideward:	Ultimate Sideward Emergency Landing Load Factor:	$n_{e_side} = 2.00$
Upward:	Ultimate Upward Emergency Landing Load Factor:	$n_{e_up} = 1.50$

Note: The basket is mounted below and to one side of the cabin. Forward deflection or failure in the emergency landing condition does not endanger the occupants. Likewise, Sideward and Upward deflection or failure in the emergency landing condition do not endanger the occupants.

5.2 Inertia Loads

Weight of basket. $W_{basket} = 55 \cdot \text{lbf}$

Cargo Capacity of basket. $W_{cargo} = 200 \cdot \text{lbf}$

Weight of aft beam. $W_{aft_beam} = 10 \cdot \text{lbf}$

Weight of forward beam. $W_{fwd_beam} = 10 \cdot \text{lbf}$

$$W_{external} := W_{basket} + W_{cargo} + (W_{aft_beam} + W_{fwd_beam})$$

Total Weight of external installation and cargo. $W_{external} = 275 \cdot \text{lbf}$

$$p_{ext} := \left(\frac{W_{basket}}{2} + \frac{2}{3} \cdot W_{cargo} + W_{fwd_beam} \right)$$

Weight of external installation on each beam, assuming 2/3 of max. cargo is at one end.

$p_{ext} =$

15

5.3 Drag Loads

	Length of basket.	$l_{\text{basket}} := 74\text{-in}$
	Width of basket.	$w_{\text{basket}} := 22\text{-in}$
	Height of basket.	$h_{\text{basket}} := 16\text{-in}$
$A_f := w_{\text{basket}} \cdot h_{\text{basket}}$	Frontal Area of basket.	$A_f = 2.44\text{ft}^2$
$A_p := l_{\text{basket}} \cdot w_{\text{basket}}$	Planar Area of basket.	$A_p = 11.3\text{ft}^2$
	Fineness ratio of basket	$\frac{l_{\text{basket}}}{w_{\text{basket}}} = 3.4$
	Drag Coefficient of Basket, (overestimated) (Ref. Hoerner, Fluid Dynamic Drag, Figure 22).	$C_{Do} := 1.6$
	Density of air at Sea Level.	$\rho := 0.002378 \frac{\text{slug}}{\text{ft}^3}$
	Never-Exceed-Speed of 206L-4. (Ref. 206L-4 Flight Manual.)	$V_{ne} := 126.5\text{knots}$
$V_d := \frac{V_{ne}}{0.9}$	Dive Speed of Bell 206L-4	$V_d = 141\text{knots}$
$\text{Drag} := \frac{\rho}{2} \cdot V_d^2 \cdot A_f \cdot C_{Do}$	Drag on basket.	$\text{Drag} = 262\text{lb}_f$
$P_{\text{drag_ult}} := \text{Drag} \cdot n_{sf} \cdot n_{ff}$	Ultimate applied Drag load on basket.	$P_{\text{drag_ult}} = 451\text{lb}_f$

5.3 Loads on Aft Beam

Both beams hold the basket 38.5" from the helicopter's center of gravity. The forward beam is attached to the fuselage at the fittings spaced 26.6 inches apart. The aft beam is attached at fittings spaced 20.5 inches apart. With attachments closer together, the reaction loads will be higher on the aft beam.

The aft beam is critical.

The basket is mounted to each beam with 2 AN4 bolts. These bolts are represented as "A" and "B" in Figure 5.1. The beam is attached to the helicopter using the External Attachment Provisions incorporated into the landing gear fittings, represented as "C" and "D".

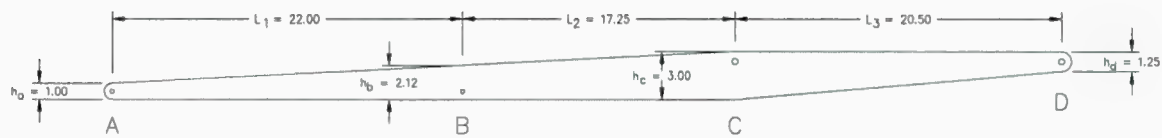


Figure 5.1 Aft Basket Support Beam

5.3.1 Geometry of Aft Beam

Spacing of basket mounting bolts (A to B).	$L_1 := 22.00 \text{ in}$
Spacing of basket to gear bolts (B to C).	$L_2 := 17.25 \text{ in}$
Spacing of gear mounting bolts (C to D).	$L_3 := 20.50 \text{ in}$
Width of beam.	$w := 1.0 \text{ in}$
Depth of beam at bolt "A".	$h_a := 1.0 \text{ in}$
Depth of beam at bolt "B".	$h_b := 2.12 \text{ in}$
Depth of beam at bolt "C".	$h_c := 3.0 \text{ in}$
Depth of beam at bolt "D".	$h_d := 1.25 \text{ in}$

Beam Properties at "B":

$$I_{x_b} := \frac{w}{12} \cdot (h_b)^3$$

Moment of Inertia of beam cross section at bolt "B" around the longitudinal axis.

$$I_{x_b} = 0.79 \cdot \text{in}^4$$

$$z_b := \frac{h_b}{2}$$

Distance from longitudinal neutral axis to extreme fibre at point "B".

$$z_b = 1.06 \cdot \text{in}$$

$$I_{z_b} := \frac{h_b}{12} \cdot (w)^3$$

Moment of Inertia of beam cross section at bolt "B" around the vertical axis.

$$I_{z_b} = 0.18 \cdot \text{in}^4$$

$$x_b := \frac{w}{2}$$

Distance from vertical neutral axis to extreme fibre at point "B".

$$x_b = 0.50 \cdot \text{in}$$

Beam Properties at "C":

$$I_{x_c} := \frac{w}{12} \cdot (h_c)^3$$

Moment of Inertia of beam cross section at bolt "C" around the longitudinal axis.

$$I_{x_c} = 2.25 \cdot \text{in}^4$$

$$z_c := \frac{h_c}{2}$$

Distance from longitudinal neutral axis to extreme fibre at point "C".

$$z_c = 1.50 \cdot \text{in}$$

$$I_{z_c} := \frac{h_c}{12} \cdot (w)^3$$

Moment of Inertia of beam cross section at bolt "C" around the vertical axis.

$$I_{z_c} = 0.25 \cdot \text{in}^4$$

$$x_c := \frac{w}{2}$$

Distance from vertical neutral axis to extreme fibre at point "C".

$$x_c = 0.50 \cdot \text{in}$$

5.3.2 Static Loads on Aft Beam

Weight of external installation on each beam, assuming 2/3 of max. cargo is at one end.

$$p_{\text{ext}} = 171 \cdot \text{lbf}$$

$$p_{z_a} := \frac{p_{\text{ext}}}{2}$$

Static vertical load on bolt "A".

$$p_{z_a} = 85 \cdot \text{lbf}$$

$$p_{z_b} := \frac{p_{\text{ext}}}{2}$$

Static vertical load on bolt "B".

$$p_{z_b} = 85 \cdot \text{lbf}$$

Applied Moment around D is counteracted by the reaction load at C. Using ΣM at D = 0, then:

$$M_D := p_{\text{ext}} \cdot \left(\frac{L_1}{2} + L_2 + L_3 \right) \quad \text{Moment around "D" applied by vertical load.} \quad M_D = 8328 \cdot \text{in} \cdot \text{lbf}$$

$$p_{z_c} := \frac{M_D}{L_3} \quad \text{Static vertical load on bolt "C".} \quad p_{z_c} = 406 \cdot \text{lbf}$$

$$p_{z_d} := p_{z_c} - p_{\text{ext}} \quad \text{Static vertical load on bolt "D".} \quad p_{z_d} = 235 \cdot \text{lbf}$$

5.3.3 Ultimate Manouvering Loads on Aft Beam

$$\quad \text{Ultimate manouvering load factor.} \quad n_{\text{man_ult}} = 5.25$$

$$\quad \text{Fitting Factor.} \quad n_{\text{ff}} = 1.15$$

$$p_{Z_ult} := p_{\text{ext}} \cdot n_{\text{man_ult}} \cdot n_{\text{ff}} \quad \text{Ultimate manouvering load on installation.} \quad p_{Z_ult} = 1031 \cdot \text{lbf}$$

$$M_{B_z} := p_{Z_ult} \cdot \frac{L_1}{2} \quad \text{Ultimate Bending Moment applied at "B".} \quad M_{B_z} = 11345 \cdot \text{in} \cdot \text{lbf}$$

$$M_{C_z} := p_{Z_ult} \cdot \left(\frac{L_1}{2} + L_2 \right) \quad \text{Ultimate Bending Moment applied at "C".} \quad M_{C_z} = 29137 \cdot \text{in} \cdot \text{lbf}$$

Loads at each bolt are shown in Figure 5.2.

$$p_{zu_a} := p_{z_a} \cdot n_{\text{man_ult}} \cdot n_{\text{ff}} \quad \text{Ultimate vertical load on bolt "A".} \quad p_{zu_a} = 516 \cdot \text{lbf}$$

$$p_{zu_b} := p_{z_b} \cdot n_{\text{man_ult}} \cdot n_{\text{ff}} \quad \text{Ultimate vertical load on bolt "B".} \quad p_{zu_b} = 516 \cdot \text{lbf}$$

$$p_{zu_c} := p_{z_c} \cdot n_{\text{man_ult}} \cdot n_{\text{ff}} \quad \text{Ultimate vertical load on bolt "C".} \quad p_{zu_c} = 2453 \cdot \text{lbf}$$

$$p_{zu_d} := p_{z_d} \cdot n_{\text{man_ult}} \cdot n_{\text{ff}} \quad \text{Ultimate vertical load on bolt "D".} \quad p_{zu_d} = 1421 \cdot \text{lbf}$$

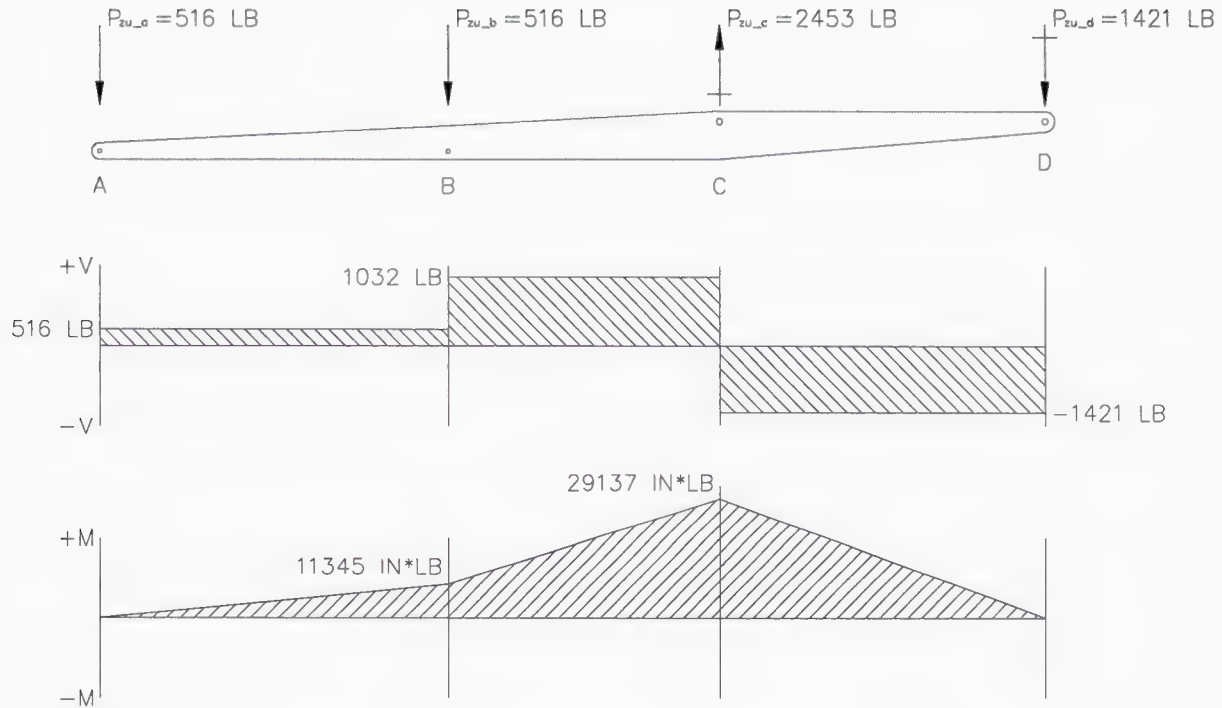


Figure 5.2 Ultimate Manouvering Loads on Aft Beam

5.3.4 Ultimate Drag Loads on Aft Beam

The mounting of the beam does not give the beam freedom to rotate around pin-joints, as it does in the vertical load case. The beam is rigidly held straight by the attachment provisions and by the basket. Assuming infinite rigidity at these attachments is a conservative approximation, where A cannot deflect backward relative to B, and C cannot deflect backward relative to D. The deformation of the beam is shown in Figure 5.3.

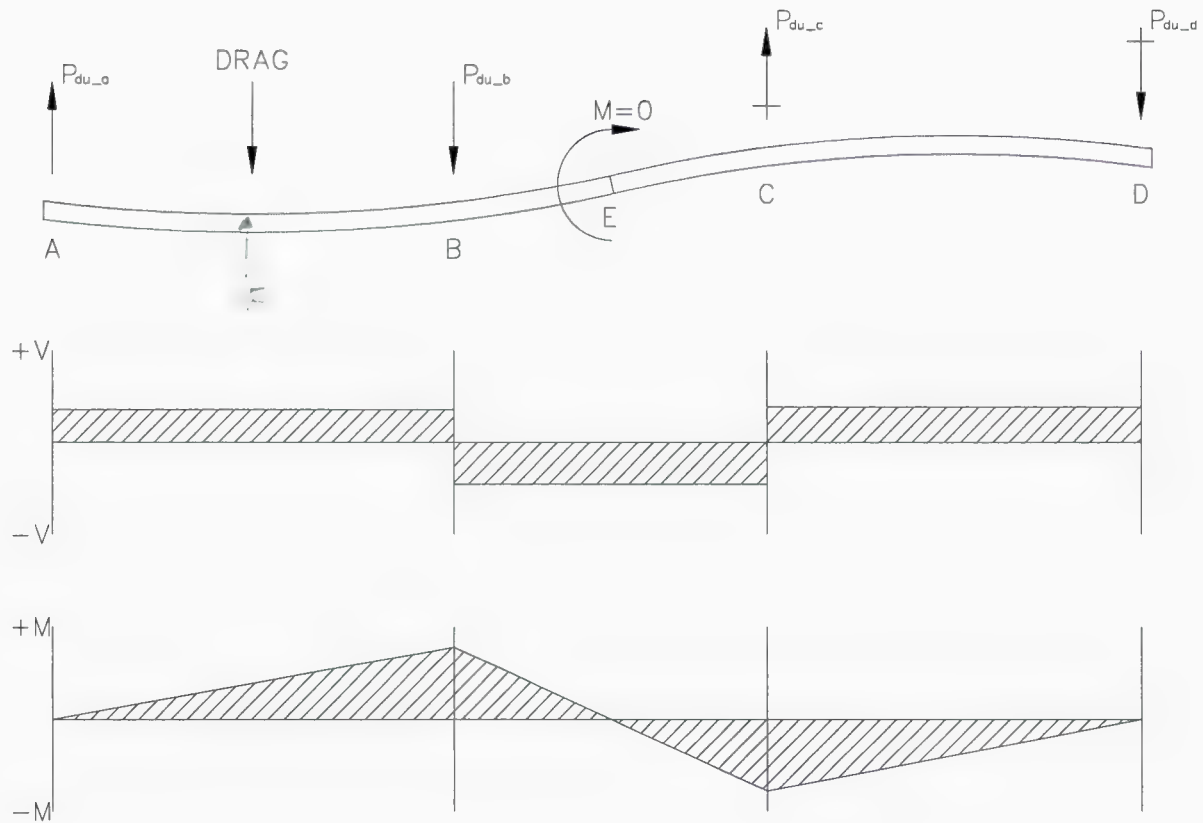


Figure 5.3 Deflection of Aft Beam Under Drag Load

The inflection point in the beam, "E", has the properties of having no bending moment, only shear. This enables another simplification. The shear at "E" is known; it is the ultimate drag load. If the beam was cut at "E", and the shear load applied, as shown in Figure 5.4, then both pieces would have the same reactions as before. The beam is still statically indeterminate, because the position of "E" is not known.

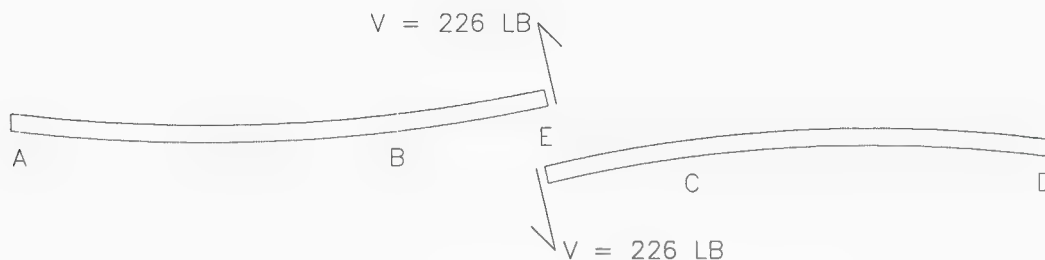


Figure 5.4 Splitting Beam at Inflection Point "E"

13.6

To conservatively simplify this problem, the shear at "E" can be applied at "C" for the outboard piece of the beam, and at "B" for the inboard part of the beam. This is shown in Figure 5.5. This ensures that the bending moments are higher than they actually are.

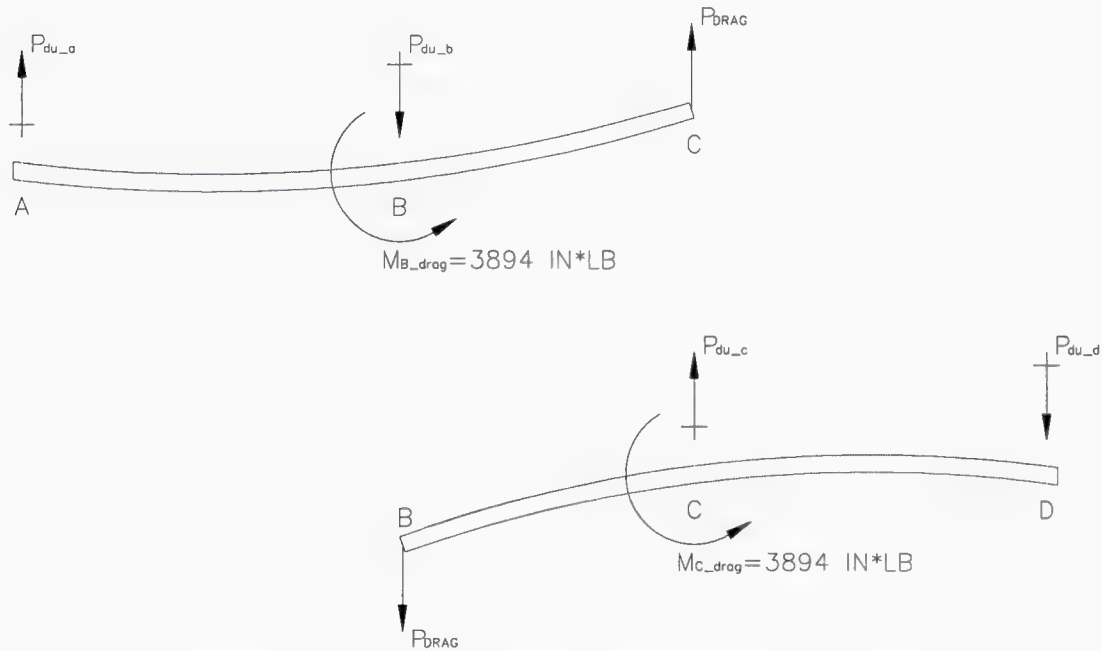


Figure 5.5 Simplification of Drag Loads on Aft Beam

The Aft beam supports half of the total drag load.

	Ultimate Aerodynamic Drag Load on basket.	$P_{drag_ult} = 451 \cdot \text{lbf}$
$P_{drag_beam} := \frac{P_{drag_ult}}{2}$	Ultimate Drag Load on each beam.	$P_{drag_beam} = 226 \cdot \text{lbf}$
$M_{B_drag} := P_{drag_beam} \cdot L_2$	Bending moment at "B" due to drag load.	$M_{B_drag} = 3894 \cdot \text{in} \cdot \text{lbf}$
$P_{du_b} := P_{drag_beam} \cdot \frac{L_2 + L_1}{L_1}$	Ultimate drag load at "B".	$P_{du_b} = 403 \cdot \text{lbf}$
$P_{du_a} := P_{drag_beam} \cdot \frac{L_2}{L_1}$	Ultimate drag load at "A".	$P_{du_a} = 177 \cdot \text{lbf}$

$$M_{C_drag} := p_{drag_beam} \cdot L_2$$

Bending moment at "C" due to drag load.

$$M_{C_drag} = 3894 \cdot \text{in} \cdot \text{lbf}$$

$$p_{du_c} := p_{drag_beam} \cdot \frac{L_2 + L_3}{L_3}$$

Ultimate drag load at "C".

$$p_{du_c} = 416 \cdot \text{lbf}$$

$$p_{du_d} := p_{drag_beam} \cdot \frac{L_2}{L_3}$$

Ultimate drag load at "D".

$$p_{du_d} = 190 \cdot \text{lbf}$$

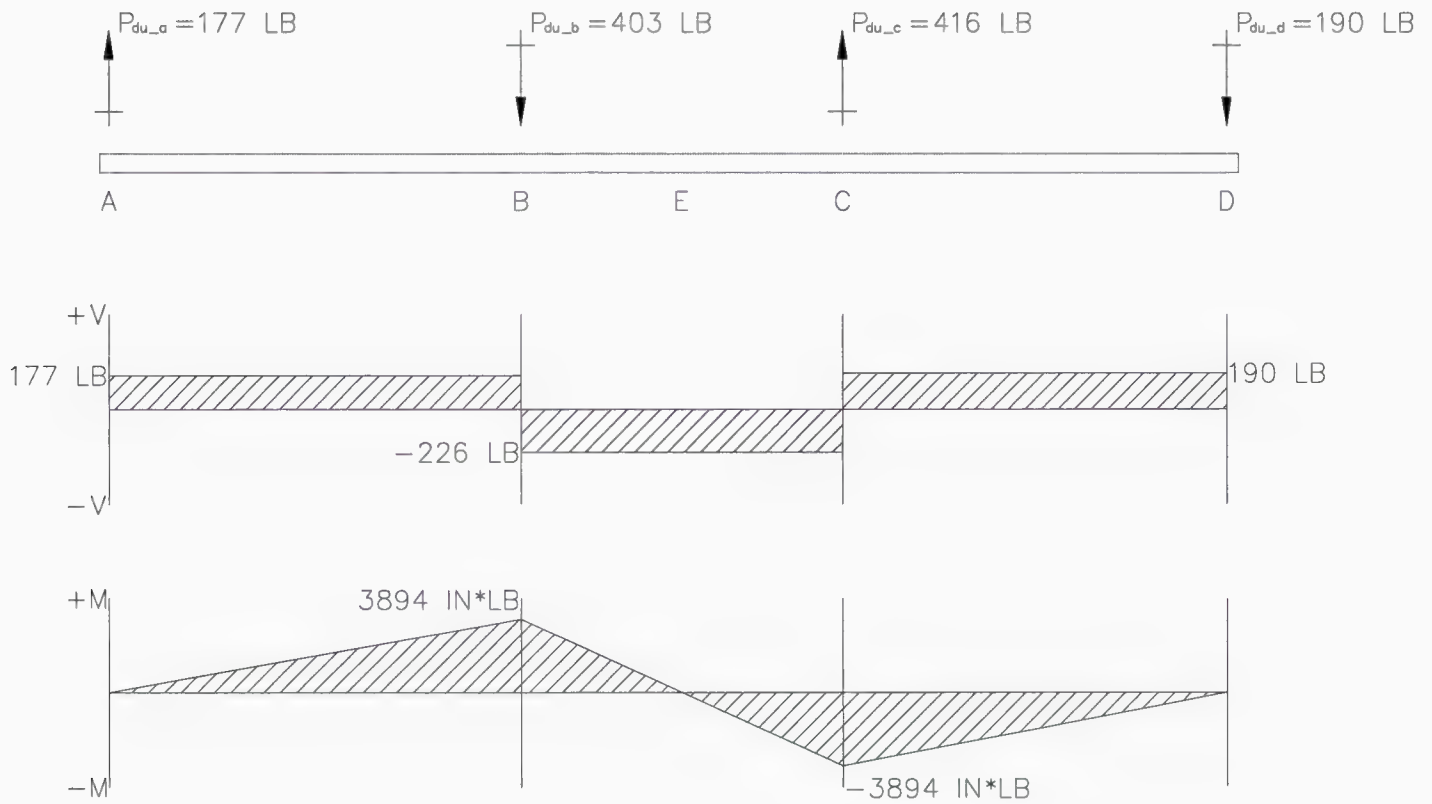


Figure 5.6 Ultimate Drag Loads on Aft Beam

6.0 STRUCTURAL ANALYSIS

6.1 Allowable Strength of External Attachment Provisions

The Manouvering Load and Drag Load are applied simultaneously. According to the limitations of the External Attachment Provisions, the Ultimate Vertical Allowable Load is dependent on the applied ultimate Longitudinal Load. This will be found using the graph in Appendix B of Report ER493.01.

Where: Ultimate drag load at "C". $P_{du_c} = 416 \cdot \text{lbf}$

Then:

$P_{z_ult} := 3413 \text{ lbf} - 0.1756 \left[2 \cdot (0 \cdot \text{lbf}) + P_{du_c} \right]$ Allowable Vertical Load on External Attachment Provision (Ref. ER493.01). $P_{z_ult} = 3340 \cdot \text{lbf}$

Allowable Longitudinal Load on External Attachment Provision (Ref. ER493.01). $P_{x_ult} := 2600 \text{ lbf}$

6.2 Allowable Strength of AN4 Bolts

Ultimate Tensile Strength of AN4 Bolt (Ref. Mil-Hdbk-5H) $P_{tu_AN4} := 4170 \text{ lbf}$

Ultimate Shear Strength of AN4 Bolt (Ref. Mil-Hdbk-5H) $P_{su_AN4} := 3682 \text{ lbf}$

6.3 Analysis of AN4 Bolts Fastening Basket to Aft Beam

AN4 Bolt at Point "A".

	Ultimate vertical load on AN4 bolt.	$P_{zu_a} = 516 \cdot \text{lbf}$
	Ultimate Shear Strength of AN4 Bolt.	$P_{su_AN4} = 3682 \cdot \text{lbf}$
$R_s := \frac{P_{zu_a}}{P_{su_AN4}}$	Shear Stress Ratio for AN4 Bolt.	$R_s = 0.14$
	Ultimate Drag load on AN4 bolt.	$P_{du_a} = 177 \cdot \text{lbf}$
	Ultimate Tensile Strength of AN4 Bolt.	$P_{tu_AN4} = 4170 \cdot \text{lbf}$
$R_t := \frac{P_{du_a}}{P_{tu_AN4}}$	Tensile Stress Ratio for AN4 Bolt.	$R_t = 0.04$
$R := R_t^2 + R_s^3$	Combined Stress Ratio for AN4 Bolt.	$R = 0.005$
Where stress factor: $N := 6.92$	Then: $(N \cdot R_s)^3 + (N \cdot R_t)^2 = 1.00$ (must = 1)	
$MS := N - 1$	Ultimate Margin of Safety (Ref. Mil-Hdbk-5E, 1.5.3.5)	$MS = 5.92$

AN4 Bolt at Point "B".

$$R_s := \frac{P_{zu_b}}{P_{su_AN4}}$$

$$R_t := \frac{P_{du_b}}{P_{tu_AN4}}$$

$$R := R_t^2 + R_s^3$$

Where stress factor: $N := 6.18$

$$MS := N - 1$$

Ultimate vertical load on AN4 bolt.

Ultimate Shear Strength of AN4 Bolt.

Shear Stress Ratio for AN4 Bolt.

Ultimate Drag load on AN4 bolt.

Ultimate Tensile Strength of AN4 Bolt.

Tensile Stress Ratio for AN4 Bolt.

Combined Stress Ratio for AN4 Bolt.

Then: $(N \cdot R_s)^3 + (N \cdot R_t)^2 = 1.00$ (must = 1)Ultimate Margin of Safety
(Ref. Mil-Hdbk-5E, 1.5.3.5)

$$P_{zu_b} = 516 \cdot \text{lbf}$$

$$P_{su_AN4} = 3682 \cdot \text{lbf}$$

$$R_s = 0.14$$

$$P_{du_b} = 403 \cdot \text{lbf}$$

$$P_{tu_AN4} = 4170 \cdot \text{lbf}$$

$$R_t = 0.10$$

$$R = 0.012$$

$$MS = 5.18$$

6.4 Analysis of Attachment to External Attachment Provisions

Attachment to Provision at Point "C".

	Ultimate vertical load at "C".	$P_{zu_c} = 2453 \cdot \text{lbf}$
	Allowable Vertical Load at Provision.	$P_{z_ult} = 3340 \cdot \text{lbf}$
$R_s := \frac{P_{zu_c}}{P_{z_ult}}$	Stress Ratio at "C".	$R_s = 0.73$
	Ultimate Drag load at "C".	$P_{du_c} = 416 \cdot \text{lbf}$
	Allowable Longitudinal Load at Provision.	$P_{x_ult} = 2600 \cdot \text{lbf}$
$R_t := \frac{P_{du_c}}{P_{x_ult}}$	Stress Ratio at "C".	$R_t = 0.16$
$R := R_t^2 + R_s^3$	Combined Stress Ratio at "C".	$R = 0.422$
Where stress factor: $N := 1.34$	Then: $(N \cdot R_s)^3 + (N \cdot R_t)^2 = 1.00$ (must = 1)	
$MS := N - 1$	Ultimate Margin of Safety (Ref. Mil-Hdbk-5E, 1.5.3.5)	$MS = 0.34$

Attachment to Provision at Point "D".

	Ultimate vertical load at "D".	$P_{zu_d} = 1421 \cdot \text{lbf}$
	Allowable Vertical Load at Provision.	$P_{z_ult} = 3340 \cdot \text{lbf}$
$R_s := \frac{P_{zu_d}}{P_{z_ult}}$	Stress Ratio at "D".	$R_s = 0.43$
	Ultimate Drag load at "D".	$P_{du_d} = 190 \cdot \text{lbf}$
	Allowable Longitudinal Load at Provision.	$P_{x_ult} = 2600 \cdot \text{lbf}$
$R_t := \frac{P_{du_d}}{P_{x_ult}}$	Stress Ratio at "D".	$R_t = 0.07$
$R := R_t^2 + R_s^3$	Combined Stress Ratio at "D".	$R = 0.082$
Where stress factor: $N := 2.33$	Then: $(N \cdot R_s)^3 + (N \cdot R_t)^2 = 1.00$ (must = 1)	
$MS := N - 1$	Ultimate Margin of Safety (Ref. Mil-Hdbk-5E, 1.5.3.5)	$MS = 1.33$

6.5 Beam Strength

Combined Bending Stress due to Manouvering Load and Drag Load at "B".

	Ultimate Bending Moment at "B" due to Manouvering Load.	$M_{B_z} = 11345 \cdot \text{in} \cdot \text{lbf}$
	Moment of Inertia of beam cross section at bolt "B" around the longitudinal axis.	$I_{x_b} = 0.79 \cdot \text{in}^4$
	Distance from longitudinal neutral axis to extreme fibre at point "B".	$z_b = 1.06 \cdot \text{in}$
	Ultimate Bending Moment at "B" due to Drag Load.	$M_{B_{\text{drag}}} = 3894 \cdot \text{in} \cdot \text{lbf}$
	Moment of Inertia of beam cross section at bolt "B" around the vertical axis.	$I_{z_b} = 0.18 \cdot \text{in}^4$
	Distance from vertical neutral axis to extreme fibre at point "B".	$x_b = 0.50 \cdot \text{in}$
$f_{b_z} := \frac{M_{B_z} \cdot z_b}{I_{x_b}}$	Vertical Bending stress applied to beam at "B".	$f_{b_z} = 15.1 \cdot \text{ksi}$
$f_{b_{\text{drag}}} := \frac{M_{B_{\text{drag}}} \cdot x_b}{I_{z_b}}$	Drag Bending stress applied to beam at "B".	$f_{b_{\text{drag}}} = 11.0 \cdot \text{ksi}$
$f_{b_{\text{comb}}} := f_{b_z} + f_{b_{\text{drag}}}$	Combined Bending stress applied to beam at "B". (Stresses are additive in rectangular cross-section, ref. Bruhn, A13)	$f_{b_{\text{comb}}} = 26.2 \cdot \text{ksi}$
	Ultimate Tensile Strength of 6061-T651 aluminum bar. (ref. Mil-Hdbk-5H)	$F_{tu_{6061}} := 42 \cdot \text{ksi}$
$MS := \frac{F_{tu_{6061}}}{f_{b_{\text{comb}}}} - 1$	Bending Margin of Safety.	$MS = 0.61$

Combined Bending Stress due to Manouvering Load and Drag Load at "C".

Ultimate Bending Moment at "C"
due to Manouvering Load.

$$M_{C_z} = 29137 \cdot \text{in} \cdot \text{lbf}$$

Moment of Inertia of beam cross section
at bolt "C" around the longitudinal axis.

$$I_{x_c} = 2.25 \cdot \text{in}^4$$

Distance from longitudinal neutral axis
to extreme fibre at point "C".

$$z_c = 1.50 \cdot \text{in}$$

Ultimate Bending Moment at "C"
due to Drag Load.

$$M_{C_{\text{drag}}} = 3894 \cdot \text{in} \cdot \text{lbf}$$

Moment of Inertia of beam cross section
at bolt "C" around the vertical axis.

$$I_{z_c} = 0.25 \cdot \text{in}^4$$

Distance from vertical neutral axis
to extreme fibre at point "C".

$$x_c = 0.50 \cdot \text{in}$$

$$f_{b_z} := \frac{M_{C_z} \cdot z_c}{I_{x_c}}$$

Vertical Bending stress applied to beam at "C". $f_{b_z} = 19.4 \cdot \text{ksi}$

$$f_{b_{\text{drag}}} := \frac{M_{C_{\text{drag}}} \cdot x_c}{I_{z_c}}$$

Drag Bending stress applied to beam at "C". $f_{b_{\text{drag}}} = 7.8 \cdot \text{ksi}$

$$f_{b_{\text{comb}}} := f_{b_z} + f_{b_{\text{drag}}}$$

Combined Bending stress applied to beam
at "C". (Stresses are additive in rectangular
cross-section, ref. Bruhn, A13)

$$f_{b_{\text{comb}}} = 27.2 \cdot \text{ksi}$$

$$MS := \frac{F_{tu_6061}}{f_{b_{\text{comb}}}} - 1$$

Bending Margin of Safety.

$$MS = 0.54$$

APPENDIX A

AIRWORTHINESS DIRECTIVES APPLICABLE TO THE BELL 206L SERIES

AIRWORTHINESS DIRECTIVES

Applicable to Canadian registered or manufactured aeronautical products

Database Last Updated: 2002-03-16

Directives Pertaining to Model: **BELL, 206L**

40 ADs found

Country:	AD Number:	AD Subject:	SB Reference:
CF	<u>CF-2001-33</u>	CHIP DETECTOR ASSEMBLY	206-01-96 REV A
CF	<u>CF-2001-13</u>	SOLOY ENGINE RPM SENSOR	SOLOY 02-680R2
CF	<u>CF-2000-13</u>	COLLECTIVE LEVER - RAISED FORGING BOSS	ASB 206-00-93
CF	<u>CF-98-43</u>	CROSSTUBE ASSEMBLIES	
CF	<u>CF-98-27</u>	TAILBOOM MODIFICATION	ASB 206L-87-47 REV C
CF	<u>CF-98-15</u>	EXTERNAL RESCUE SYSTEMS	CAR 702.21
CF	<u>CF-1998-42R4</u>	CRACKED TAIL BOOM SKIN	206L-99-115 REV E
CF	<u>CF-97-03</u>	MAST AND TRUNNION RETIREMENT LIFE	
CF	<u>CF-96-11</u>	FUEL CELL VENT TUBE - WATER INGESTION	206-95-156
CF	<u>CF-95-19</u>	TEMP-PLATES OVERHEAT INDICATORS	ASB 206L-93-91 REVB
CF	<u>CF-95-17</u>	CROSSTUBE FAILURES	AA-ASB 94045/94046
CF	<u>CF-95-11R2</u>	UNAPPROVED BOLTS, FLIGHT CONTROL SERVO ACTUATORS	206-67-02,206-67A-01
US	<u>95-09-06</u>	INADVERTANT FUEL VALVE SWITCH POSITIONING	206-90-54/206L-90-67
US	<u>94-24-11</u>	TAIL ROTOR DRIVESHAFT MISALIGNMENT	206-92-69/206L-92-84
US	<u>94-20-03</u>	MAIN ROTOR HUB TRUNNION	206L-93-90
US	<u>94-19-02</u>	SWASHPLATE SUPPORT ASSEMBLY	206-93-74 REV B
US	<u>94-15-07</u>	MAIN ROTOR BLADES CRACKS	ASB 206-93-77
US	<u>92-06-12</u>	MAIN TRANSMISSION SUNGEAR	206-90-56,206L-90-69
US	<u>92-01-05</u>	MAIN ROTOR BLADES (FALSIFIED COMPONENT RECORDS)	
US	<u>91-23-15</u>	ENGINE RPM SENSOR	SOLOY 02-680
US	<u>91-03-12</u>	EMERGENCY FLOAT BAGS	206L-89-63,206-89-49
US	<u>90-21-03</u>	TAIL ROTOR BLADE TIP WEIGHT	
US	<u>90-13-01R1</u>	TAIL ROTOR BLADES	
US	<u>89-22-01R1</u>	MAIN ROTOR BLADES	
US	<u>89-20-13</u>	HORIZONTAL STABILIZER	
US	<u>88-26-03</u>	FUEL SYSTEM FLOW SWITCHES	206L-88-52
US	<u>88-23-03</u>	TAIL ROTOR YOKE ASSEMBLY	
US	<u>87-10-11</u>	MAIN ROTOR MAST	206-87-37, -44
US	<u>86-24-01</u>	TAIL ROTOR YOKE	
US	<u>85-26-06</u>	TAIL ROTOR BLADES	
US	<u>85-25-01</u>	CYCLIC CONTROL STICK	206-85-29,206L-85-36
US	<u>85-09-04</u>	MAIN ROTOR BLADES	ASB 206L-85-35
US	<u>83-03-04</u>	CHECK OF SHEAR HEADS-FLOAT INFLATION VALVES	SB 206L-81-21
US	<u>82-16-12</u>	WITH CHADWICK C-22 AFS PER STC SH139W	CHADWICK SB 20-81-01
US	<u>82-05-03</u>	HORIZONTAL STABILIZER ASSEMBLY	ASB 206L-81-23 REV A
US	<u>80-18-04R1</u>	MAIN ROTOR TRUNNION	ASB 206L-80-9 REV A
US	<u>80-17-05</u>	TAIL ROTOR BLADES	
US	<u>78-24-06R1</u>	HORIZONTAL STABILIZER	
US	<u>78-11-02R1</u>	M/R BLADE STRAPS	
US	<u>76-14-05</u>	FUEL SYSTEM COMPONENTS	

CF-95-17 BELL

Applies to all models of Bell 206 series helicopters equipped with the following crosstube assemblies (crosstubes):

- (i) Aeronautical Accessories Inc. P/N 206-320-101 and -102
206-321-001 and -002
206-323-*
206-325-*
206-328-*
206-329-001 and -002
- (ii) Airborne Supply Inc. P/N AB206-050-107 and -119*
AB206-053-109*
- (iii) Bell Helicopter Textron P/N 206-050-107, -119, -134, -157 and 169*
206-053-109, -119 and -129*

(iv) Other manufacturers, as approved by the P/N Any of the above
Federal Aviation Administration (FAA)
under Parts Manufacturer Approval (PMA)

*All dash numbers

Compliance is required as indicated.

Two accidents have been attributed to crosstube failures. There has also been a number of reports of cracks due to corrosion or metal fatigue that might cause a failure of the crosstubes. On the crosstubes of older design, the cracks were mostly found at the rivet holes in the attachment-to-fuselage area and at the saddle attachment. On the newer, clamp-on tubes without holes, the cracks were mostly found in the saddle attachment area and along the line where the clamp touches the tube. Helicopters operating in a corrosive environment, or being used in a training or sightseeing role involving frequent landings are most affected.

To prevent failure of the affected crosstubes accomplish either Part I or Part II below, depending on the type of crosstube:

Part I For Aeronautical Accessories Inc. Crosstubes

A. For Model 206A and 206B Helicopters:

1. Initially, within the next 100 hours time-in-service, unless already accomplished, perform an inspection as per Aeronautical Accessories Inc. Alert Service Bulletin (ASB) No. 94045, Revision B dated 17 April 1995.
2. Not later than 1 February 1996, incorporate into the operator's aircraft inspection program the procedures of Report No. AA-94022, Revision G or later revision, as referenced in ASB No. 94045, Revision B. The required procedures shall be repeated at each annual or 300-hour scheduled inspection, whichever comes first.

B. For Model 206L, 206L-1, -3 and -4 Helicopters:

1. Initially, within the next 100 hours time-in-service, unless already accomplished, perform an inspection as per Aeronautical Accessories Inc. ASB No. 94046, Revision B dated 17 April 1995.
2. Not later than 1 February 1996, incorporate into the operator's aircraft inspection program the procedures of Report No. AA-94023, Revision D or later revision, as referenced in ASB No. 94046, Revision B. The required procedures shall be repeated at each annual or 300-hour scheduled inspection, whichever comes first.

Part II For All Other Affected Crosstubes

1. Initially, within the next 100 hours time in service, perform a detailed visual inspection of the crosstubes for cracks and corrosion, using a 10-power magnifying glass. Pay particular attention in the strap and the saddle attachment area for mechanical damage and corrosion which could lead to cracks. If there is any indication of cracks or corrosion, remove the paint in suspected areas and perform the detailed visual inspection. If the crosstube has rivet holes in the attachment-to-fuselage area, visually check using a 10-power magnifying glass for cracks emanating from the rivets holes. Refer to the applicable Maintenance Manual for inspection limits. In the absence of manufacturer's limits, the maximum allowable depth of corrosion is limited to 0.005 inch over an area not exceeding one-fourth the circumference by 3 inches in length after cleanup, regardless of location. If any crosstube is found corroded beyond the maximum allowable limit, or cracked, replace the part with a serviceable one before further flight.

2. Not later than 1 February 1996, incorporate the requirements of paragraph 1 above in the operator's aircraft inspection program. The required inspection shall be repeated at each annual or 300-hour scheduled inspection, whichever comes first.

Note: The amendments to the aircraft inspection program, required by Parts I and II above, eliminate the requirement to record in the aircraft records the intervals of this directive and the repeat certification of accomplishment in accordance with Airworthiness Manual Chapter 575. This inspection task insertion is to include the following:

"AD CF-95-17 refers. This task is not to be escalated or removed from the inspection program without approval by Transport Canada, Chief Continuing Airworthiness, Ottawa."

Replacement of affected crosstubes with later part number crosstubes constitutes terminating action for the inspection requirements of this directive.

Alternative means of compliance with the requirements of this directive may be used only if approved by the Director, Airworthiness Branch, Transport Canada, Ottawa. Any application should be made to the appropriate regional office.

This airworthiness directive (AD) supersedes Federal Aviation Administration (FAA) AD 95-11-14. It also supersedes Transport Canada Alleviation No. AARDG 95/A90, issued to operators of Canadian registered Bell 206 helicopters on 16 June 1995.

This directive becomes effective 9 January 1996.

CF-98-43 BELL

Applies to all Bell Helicopter Textron Canada (BHTC) Model 206 series helicopters equipped with crosstube assemblies (crosstubes) of older design having rivet holes in the support area designated for rivet-on supports with the following, but not limited to, part numbers:

- (i) Aeronautical Accessories Inc. 206-321-001 and -002
- (ii) Airborne Supply Inc. AB206-050-107-025 and -027
 AB206-050-119-005 and -007
- (iii) Bell Helicopter 206-050-107-011, -013, -025 and -027
 206-050-119-001, -003, -005 and -007
 206-050-134-001, -003, -005, -007, -009 and -011
 206-050-169-001, -003, -011 and -013
 206-053-109-001, -003, -005 and -007
 206-053-119-001 and -003
 206-053-129-009, -011, -101 and -103
- (iv) Other manufacturers, as approved by Any of the above the Federal Aviation
Administration (FAA) under Parts Manufacturer Approval (PMA)

Note: The riveted crosstubes of newer configurations, P/N 206-050-2xx-xxx and 206-053-2xx-xxx, having rivet holes only on the sides of the crosstube, are not affected by this directive.

Compliance is required as indicated, unless already accomplished.

The older versions of riveted crosstubes were subject to fatigue cracking; the large majority of cracks started at the top rivet holes under the support assemblies. A few started elsewhere at corrosion or mechanically damaged initiation points. Two accidents have been attributed to crosstubes breaking from cracks starting at the rivet holes. Since the issue of Airworthiness Directive CF-95-17, which introduced inspections, a total failure of an aft crosstube occurred just 40 hours air time after it was properly inspected. The crack had gone undetected under the strap assembly until progressing rapidly once near the strap's edge. Therefore, these older riveted configurations need to be retired within a reasonable time in service.

To prevent a possible catastrophic failure of the crosstube assemblies accomplish the following:

1. Within the next 100 hours air time after the effective date of this directive, remove from the helicopter any crosstube of unknown history or having a total of six or more years in service.
2. No later than 31 December 2000, remove any of the affected crosstubes, regardless of time in service.

This directive becomes effective 15 February 1999.

APPENDIX B

DRAG COEFFICIENTS FOR BLUNT-ENDED RECTANGULAR BODIES

HOERNER, FLUID DYNAMIC DRAG, PAGE 3-12, FIGURE 22

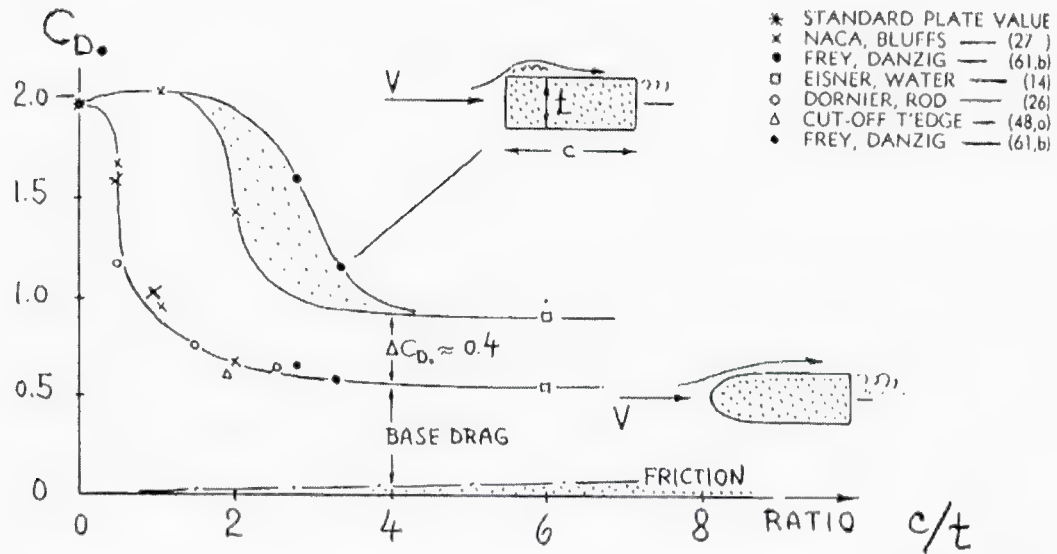


Figure 22. Drag coefficient of "rectangular" sections (tested between walls) with blunt leading edge (upper part) and with rounded shape (lower part), against length ratio.

BASKET AND SUPPORT BEAM ANALYSIS

BELL 407 HELICOPTER LOAD FACTORS, FAR 27:

FAR 27.561(b)(3)

Ultimate Upward Emergency Landing Load Factor: $n_{e_up} := 1.5$
 Ultimate Forward Emergency Landing Load Factor: $n_{e_fwd} := 4.0$
 Ultimate Sideward Emergency Landing Load Factor: $n_{e_side} := 2.0$
 Ultimate Downward Emergency Landing Load Factor: $n_{e_down} := 4.0$

FAR 27.625 Fitting Factor: $n_{ff} := 1.15$

FAR 27.303 Safety Factor: $n_{sf} := 1.5$

FAR 27.337(a) Limit Positive Maneuvering Load Factor: $n_{man} := 3.5$

$n_{man_ult} := n_{man} \cdot n_{sf}$ Ultimate Positive Maneuvering Load Factor: $n_{man_ult} = 5.25$

Limit Negative Maneuvering Load Factor: $n_{man_n} := -1.0$

$n_{man_neg_u} := n_{man_n} \cdot n_{sf}$ Ultimate Negative Maneuvering Load Factor: $n_{man_neg_u} = -1.5$

CRITICAL ULTIMATE LOAD FACTORS:

Downward: Ultimate Positive Maneuvering Load Factor: $n_{man_ult} = 5.25$

Forward: Ultimate Forward Emergency Landing Load Factor: $n_{e_fwd} = 4.00$

Sideward: Ultimate Sideward Emergency Landing Load Factor: $n_{e_side} = 2.00$

Upward: Ultimate Upward Emergency Landing Load Factor: $n_{e_up} = 1.50$

Note: The basket is mounted below and to one side of the cabin. Forward deflection or failure in the emergency landing condition does not endanger the occupants.

Sideward and Upward deflection or failure of the basket in the emergency landing condition do not endanger the occupants. Sideward and Upward Load Factors are used in the tests to ensure that the lid of the basket does not open in flight.

DRAG LOAD ON BASKET

Length of basket. $l_{\text{basket}} := 96.5 \cdot \text{in}$

Width of basket. $w_{\text{basket}} := 22 \cdot \text{in}$

Height of basket. $h_{\text{basket}} := 16 \cdot \text{in}$

$$A_f := w_{\text{basket}} \cdot h_{\text{basket}}$$

Frontal Area of basket. $A_f = 2.44 \cdot \text{ft}^2$

$$A_p := l_{\text{basket}} \cdot w_{\text{basket}}$$

Planar Area of basket. $A_p = 14.74 \cdot \text{ft}^2$

Fineness ratio of basket $\frac{l_{\text{basket}}}{w_{\text{basket}}} = 4.4$

Note: The same C_{Do} is used here as for the shorter basket. C_{Do} is reduced as fineness ratio increases, (ref Fig 22.)

Drag Coefficient of Basket, (overestimated)
(Ref. Hoerner, Fluid Dynamic Drag, Chapter 3, Figure 22). $C_{Do} := 1.6$

Density of air at Sea Level. $\rho := 0.002378 \cdot \frac{\text{slug}}{\text{ft}^3}$

Never-Exceed-Speed of 407.
(Ref. 407 Flight Manual.) $V_{ne} := 140 \cdot \text{knots}$

$$V_d := \frac{V_{ne}}{0.9}$$

Dive Speed of Bell 407 $V_d = 156 \cdot \text{knots}$

$$\text{Drag} := \frac{\rho}{2} \cdot V_d^2 \cdot A_f \cdot C_{Do}$$

Drag on basket. $\text{Drag} = 321 \cdot \text{lbf}$

$$P_{\text{drag_ult}} := \text{Drag} \cdot n_{sf} \cdot n_{ff}$$

Ultimate applied Drag load on basket. $P_{\text{drag_ult}} = 553 \cdot \text{lbf}$

Lateral Aerodynamic Center of basket. $AC_{\text{drag}} := 42.0 \cdot \text{in}$

LOADS ON BASKET

Weight of basket. $W_{\text{basket}} := 60 \cdot \text{lbf}$

Cargo Capacity of basket. $W_{\text{cargo}} := 200 \cdot \text{lbf}$

Fitting Factor (Not required where compliance is shown by test) $n_{\text{ff}} := 1.15$

DOWNWARD:

The basket shall support its contents under the maximum maneuvering load factor.

Ultimate Positive Maneuvering Load Factor: $n_{\text{man_ult}} = 5.25$

$p_{z_ult} := (W_{\text{basket}} + W_{\text{cargo}}) \cdot n_{\text{man_ult}}$ Ultimate Vertical Load on basket. $p_{z_ult} = 1365 \cdot \text{lbf}$

FORWARD:

Deflection of the basket, or shifting of its contents in the forward direction in an emergency landing does not endanger the occupants of the helicopter.

Ultimate Forward Emergency Load Factor: Not applicable

SIDEWARD:

Deflection of the basket, or shifting of its contents in the sideward direction in an emergency landing does not endanger the occupants of the helicopter. However, to ensure that the lid of the basket cannot open during flight, the ultimate sideward load factor will be used. The handle latches the lid closed, and is retained by a torsion spring.

Ultimate Sideward Emergency Load Factor: $n_{e_side} = 2.00$

The handle must stay closed when pulled sideways with twice its weight.

UPWARD:

For attachment of the basket to the helicopter, the critical vertical load is downward, but this load factor will be used to ensure that the lid cannot open during flight or an emergency landing.

Ultimate Upward Emergency Load Factor: $n_{e_up} = 1.50$

$p_{z_lid} := W_{\text{cargo}} \cdot n_{e_up}$ Ultimate Upward Load of cargo on lid. $p_{z_lid} = 300 \cdot \text{lbf}$

AFT BEAM GEOMETRY:

Weight of aft beam.

$$W_{\text{aft_beam}} := 10 \cdot \text{lbf}$$

Spacing of basket mounting bolts (A to B).
(Not used for this installation)

$$L_1 := 22.00 \cdot \text{in}$$

Spacing of basket to gear bolts (B to C).
(Not used for this installation)

$$L_2 := 17.25 \cdot \text{in}$$

Spacing of gear mounting bolts (C to D).

$$L_3 := 20.50 \cdot \text{in}$$

Spacing of plate mounting bolts (A to F)

$$L_4 := 13.125 \cdot \text{in}$$

Spacing of plate to gear bolts (F to C)

$$L_5 := 26.125 \cdot \text{in}$$

Distance from bolt F to C of G

$$L_6 := 5.625 \cdot \text{in}$$

Width of beam.

$$w := 1.0 \cdot \text{in}$$

Depth of beam at bolt "A".

$$h_a := 1.0 \cdot \text{in}$$

Depth of beam at bolt "B".
(Not used for this installation)

$$h_b := 2.12 \cdot \text{in}$$

Depth of beam at bolt "C".

$$h_c := 3.0 \cdot \text{in}$$

Depth of beam at bolt "D".

$$h_d := 1.25 \cdot \text{in}$$

Depth of beam at bolt "F"

$$h_f := 1.71 \cdot \text{in}$$

Beam Properties at "C":

$$I_{x_c} := \frac{w}{12} \cdot (h_c)^3$$

Moment of Inertia of beam cross section
at bolt "C" around the longitudinal axis.

$$I_{x_c} = 2.25 \cdot \text{in}^4$$

$$z_c := \frac{h_c}{2}$$

Distance from longitudinal neutral axis
to extreme fibre at point "C".

$$z_c = 1.50 \cdot \text{in}$$

$$I_{z_c} := \frac{h_c}{12} \cdot (w)^3$$

Moment of Inertia of beam cross section
at bolt "C" around the vertical axis.

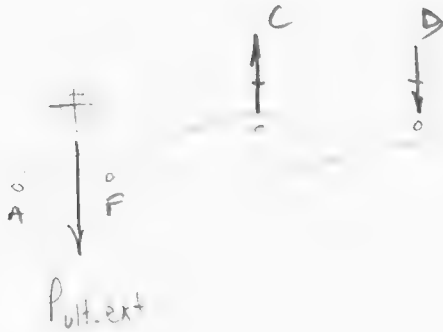
$$I_{z_c} = 0.25 \cdot \text{in}^4$$

$$x_c := \frac{w}{2}$$

Distance from vertical neutral axis
to extreme fibre at point "C".

$$x_c = 0.50 \cdot \text{in}$$

ANALYSIS OF AFT BEAM LOADS:



Weight of basket.

$$W_{\text{basket}} = 60 \cdot \text{lbf}$$

Cargo Capacity of basket.

$$W_{\text{cargo}} = 200 \cdot \text{lbf}$$

Weight of aft beam.

$$W_{\text{aft_beam}} = 10 \cdot \text{lbf}$$

Weight of forward beam.

$$W_{\text{fwd_beam}} = 10 \cdot \text{lbf}$$

Ultimate maneuvering load factor.

$$n_{\text{man_ult}} = 5.25$$

Fitting Factor.

$$n_{\text{ff}} = 1.15$$

$$W_{\text{external}} := W_{\text{basket}} + W_{\text{cargo}} + (W_{\text{aft_beam}} + W_{\text{fwd_beam}})$$

Total Weight of external installation and cargo.

$$W_{\text{external}} = 280 \cdot \text{lbf}$$

$$W_{\text{beam}} := \left(\frac{W_{\text{basket}}}{2} + \frac{2}{3} \cdot W_{\text{cargo}} + W_{\text{aft_beam}} \right)$$

Weight of external installation on each beam, assuming 2/3 of max. cargo is at one end.

$$W_{\text{beam}} = 173 \cdot \text{lbf}$$

$$p_{\text{ult_ext}} := \left(\frac{W_{\text{basket}}}{2} + \frac{2}{3} \cdot W_{\text{cargo}} + W_{\text{aft_beam}} \right) \cdot n_{\text{man_ult}} \cdot n_{\text{ff}}$$

Ultimate load of external installation on each beam, assuming 2/3 of max. cargo is at one end.

$$p_{\text{ult_ext}} = 1047 \cdot \text{lbf}$$

Ultimate Vertical Loads on Aft Beam:

$$p_{\text{zu_a}} := p_{\text{ult_ext}} \cdot \frac{L_6}{L_4}$$

Ultimate vertical load on bolt "A".

$$p_{\text{zu_a}} = 449 \cdot \text{lbf}$$

$$p_{\text{zu_f}} := p_{\text{ult_ext}} \cdot \frac{L_4 - L_6}{L_4}$$

Ultimate vertical load on bolt "F".

$$p_{\text{zu_f}} = 598 \cdot \text{lbf}$$

Applied Moment around D is counteracted by the reaction load at C. Using ΣM at D = 0, then:

$$M_D := p_{\text{ult_ext}} \cdot (L_6 + L_5 + L_3)$$

Moment around "D" applied by vertical load.

$$M_D = 54680 \cdot \text{in} \cdot \text{lbf}$$

$$p_{\text{zu_c}} := \frac{M_D}{L_3}$$

Ultimate vertical load on bolt "C".

$$p_{\text{zu_c}} = 2667 \cdot \text{lbf}$$

$$p_{\text{zu_d}} := p_{\text{zu_c}} - p_{\text{ult_ext}}$$

Ultimate vertical load on bolt "D".

$$p_{\text{zu_d}} = 1621 \cdot \text{lbf}$$

Ultimate Vertical Loads on Aft Beam:

	Ultimate maneuvering load on beam	$P_{ult_ext} = 1047 \cdot \text{lbf}$
$M_{C_z} := P_{ult_ext} \cdot (L_6 + L_5)$	Ultimate Bending Moment applied at "C".	$M_{C_z} = 33226 \cdot \text{in} \cdot \text{lbf}$

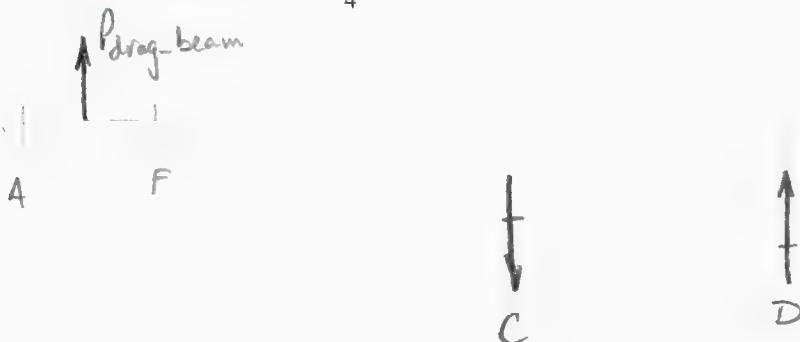
Drag Load on Aft Beam:

Assuming the load is applied as a simple cantilever, supported at "C" and "D".
The Aft beam supports half of the total drag load.

	Ultimate Aerodynamic Drag Load on basket.	$P_{drag_ult} = 553 \cdot \text{lbf}$
$P_{drag_beam} := \frac{P_{drag_ult}}{2}$	Ultimate Drag Load on each beam.	$P_{drag_beam} = 276 \cdot \text{lbf}$
$M_{C_drag} := P_{drag_beam} \cdot (L_5 + L_6)$	Bending moment at "C" due to drag load.	$M_{C_drag} = 8778 \cdot \text{in} \cdot \text{lbf}$
$P_{du_c} := P_{drag_beam} \cdot \frac{L_5 + L_3}{L_3}$	Ultimate drag load on bolt "C".	$P_{du_c} = 629 \cdot \text{lbf}$
$P_{du_d} := P_{drag_beam} \cdot \frac{L_5}{L_3}$	Ultimate drag load on bolt "D".	$P_{du_d} = 352 \cdot \text{lbf}$

The drag load is not applied directly between "A" and "F". The load is not equally distributed, it is closer to "F".

$P_{du_a} := P_{drag_beam} \cdot \frac{L_6}{L_4}$	Ultimate drag load on bolt "A".	$P_{du_a} = 118 \cdot \text{lbf}$
$P_{du_f} := P_{drag_beam} \cdot \frac{L_4 - L_6}{L_4}$	Ultimate drag load on bolt "F".	$P_{du_f} = 158 \cdot \text{lbf}$



Stresses in Mounting Bolts on Aft Beam:

The Maneuvering Load and Drag Load are applied simultaneously. According to the limitations of the External Attachment Provisions, the Ultimate Vertical Allowable Load is dependent on the applied ultimate Longitudinal Load. This will be found using the graph in Appendix B of Report ER493.01.

Where: Ultimate drag load on bolt "C". $P_{du_c} = 629 \cdot \text{lbf}$

Then:

$P_{z_ult} := 3413 \cdot \text{lbf} - 0.1756 \cdot [2 \cdot (0 \cdot \text{lbf}) + P_{du_c}]$ Allowable Vertical Load on External Attachment Provision (Ref. ER493.01). $P_{z_ult} = 3303 \cdot \text{lbf}$

Allowable Longitudinal Load on External Attachment Provision (Ref. ER493.01). $P_{x_ult} := 2600 \cdot \text{lbf}$

Fastener Strength AN4 Bolt (Ref. Mil-Hdbk-5J):

Ultimate Tensile Strength of AN4 Bolt (Ref. Mil-Hdbk-5J). $P_{tu_AN4} := 4170 \cdot \text{lbf}$

Ultimate Shear Strength of AN4 Bolt (Ref. Mil-Hdbk-5J). $P_{su_AN4} := 3680 \cdot \text{lbf}$

AN4 Bolt at Point "A". Bolt is in double shear.

Ultimate vertical load on AN4 bolt. $P_{zu_a} = 449 \cdot \text{lbf}$

Ultimate Shear Strength of AN4 Bolt. $P_{su_AN4} = 3680 \cdot \text{lbf}$

$$R_s := \frac{P_{zu_a}}{2 \cdot P_{su_AN4}}$$

Shear Stress Ratio for AN4 Bolt. $R_s = 0.06$

Ultimate Drag load on AN4 bolt. $P_{du_a} = 118 \cdot \text{lbf}$

Ultimate Tensile Strength of AN4 Bolt. $P_{tu_AN4} = 4170 \cdot \text{lbf}$

$$R_t := \frac{P_{du_a}}{P_{tu_AN4}}$$

Tensile Stress Ratio for AN4 Bolt. $R_t = 0.03$

$$R := R_t^2 + R_s^3$$

Combined Stress Ratio for AN4 Bolt. $R = 0.001$

Where stress factor: $N := 15.3$ Then: $(N \cdot R_s)^3 + (N \cdot R_t)^2 = 1.00$ (must = 1)

$MS := N - 1$ Ultimate Margin of Safety (Ref. Mil-Hdbk-5E, 1.5.3.5) $MS = 14.30$

AN4 Bolt at Point "F". Bolt is in double shear.

	Ultimate vertical load on AN4 bolt.	$P_{zu_f} = 598 \cdot \text{lbf}$
	Ultimate Shear Strength of AN4 Bolt.	$P_{su_AN4} = 3680 \cdot \text{lbf}$
$R_s := \frac{P_{zu_f}}{2 \cdot P_{su_AN4}}$	Shear Stress Ratio for AN4 Bolt.	$R_s = 0.08$
	Ultimate Drag load on AN4 bolt.	$P_{du_f} = 158 \cdot \text{lbf}$
	Ultimate Tensile Strength of AN4 Bolt.	$P_{tu_AN4} = 4170 \cdot \text{lbf}$
$R_t := \frac{P_{du_f}}{P_{tu_AN4}}$	Tensile Stress Ratio for AN4 Bolt.	$R_t = 0.04$
$R := R_t^2 + R_s^3$	Combined Stress Ratio for AN4 Bolt.	$R = 0.002$

Where stress factor: $N := 11.46$ Then: $(N \cdot R_s)^3 + (N \cdot R_t)^2 = 1.00$ (must = 1)

$MS := N - 1$ Ultimate Margin of Safety
(Ref. Mil-Hdbk-5E, 1.5.3.5) $MS = 10.46$

Attachment to Provision at Point "C".

	Ultimate vertical load at "C".	$P_{zu_c} = 2667 \cdot \text{lbf}$
	Allowable Vertical Load at Provision.	$P_{z_ult} = 3303 \cdot \text{lbf}$
$R_s := \frac{P_{zu_c}}{P_{z_ult}}$	Stress Ratio at "C".	$R_s = 0.81$
	Ultimate Drag load at "C".	$P_{du_c} = 629 \cdot \text{lbf}$
	Allowable Longitudinal Load at Provision.	$P_{x_ult} = 2600 \cdot \text{lbf}$
$R_t := \frac{P_{du_c}}{P_{x_ult}}$	Stress Ratio at "C".	$R_t = 0.24$
$R := R_t^2 + R_s^3$	Combined Stress Ratio at "C".	$R = 0.585$

Where stress factor: $N := 1.204$ Then: $(N \cdot R_s)^3 + (N \cdot R_t)^2 = 1.00$ (must = 1)

$MS := N - 1$ Ultimate Margin of Safety
(Ref. Mil-Hdbk-5E, 1.5.3.5) $MS = 0.20$

Attachment to Provision at Point "D".

	Ultimate vertical load at "D".	$P_{zu_d} = 1621 \cdot \text{lbf}$
	Allowable Vertical Load at Provision.	$P_{z_ult} = 3303 \cdot \text{lbf}$
$R_s := \frac{P_{zu_d}}{P_{z_ult}}$	Stress Ratio at "D".	$R_s = 0.49$

	Ultimate Drag load at "D".	$P_{du_d} = 352 \cdot \text{lbf}$
	Allowable Longitudinal Load at Provision.	$P_{x_ult} = 2600 \cdot \text{lbf}$
$R_t := \frac{P_{du_d}}{P_{x_ult}}$	Stress Ratio at "D".	$R_t = 0.14$

$R := R_t^2 + R_s^3$	Combined Stress Ratio at "D".	$R = 0.137$
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Where stress factor: $N := 1.99$	Then: $(N \cdot R_s)^3 + (N \cdot R_t)^2 = 1.00$ (must = 1)
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$MS := N - 1$	Ultimate Margin of Safety (Ref. Mil-Hdbk-5E, 1.5.3.5)	$MS = 0.99$
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Beam Structural Analysis:

Combined Bending Stress due to Maneuvering Load and Drag Load at "C".

Ultimate Bending Moment at "C"
due to Maneuvering Load.

$$M_{C_z} = 33226 \cdot \text{in} \cdot \text{lbf}$$

Moment of Inertia of beam cross section
at bolt "C" around the longitudinal axis.

$$I_{x_c} = 2.25 \cdot \text{in}^4$$

Distance from longitudinal neutral axis
to extreme fibre at point "C".

$$z_c = 1.50 \cdot \text{in}$$

Ultimate Bending Moment at "C"
due to Drag Load.

$$M_{C_{\text{drag}}} = 8778 \cdot \text{in} \cdot \text{lbf}$$

Moment of Inertia of beam cross section
at bolt "C" around the vertical axis.

$$I_{z_c} = 0.25 \cdot \text{in}^4$$

Distance from vertical neutral axis
to extreme fibre at point "C".

$$x_c = 0.50 \cdot \text{in}$$

$$f_{b_z} := \frac{M_{C_z} \cdot z_c}{I_{x_c}}$$

Vertical Bending stress applied to beam at "C".

$$f_{b_z} = 22.2 \cdot \text{ksi}$$

$$f_{b_{\text{drag}}} := \frac{M_{C_{\text{drag}}} \cdot x_c}{I_{z_c}}$$

Drag Bending stress applied to beam at "C".

$$f_{b_{\text{drag}}} = 17.6 \cdot \text{ksi}$$

$$f_{b_{\text{comb}}} := f_{b_z} + f_{b_{\text{drag}}}$$

Combined Bending stress applied to beam
at "C". (Stresses are additive in rectangular
cross-section, ref. Bruhn, A13)

$$f_{b_{\text{comb}}} = 39.7 \cdot \text{ksi}$$

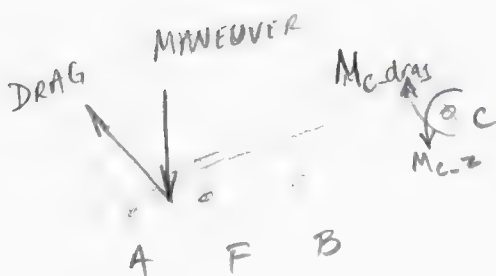
Ultimate tensile strength of 6061-T6 Aluminum
extruded bar (Ref: MIL-HDBK-5J)

$$F_{tu_{6061}} = 42 \cdot \text{ksi}$$

$$MS := \frac{F_{tu_{6061}}}{f_{b_{\text{comb}}}} - 1$$

Bending Margin of Safety.

$$MS = 0.06$$



Attachment Point "C" on Aft Beam

Shear Tear-Out and Bearing

Hole distance from edge. $d_c := 0.625 \cdot \text{in}$

Diameter of Hole C. $D_c := 0.375 \cdot \text{in}$

Edge Distance of Hole C. $\frac{d_c}{D_c} = 1.67$

Width of beam. $w = 1.00 \cdot \text{in}$

Ultimate Shear Strength of 6061-T651 aluminum (Ref. Mil-Hdbk-5H). $F_{su_6061} := 27 \cdot \text{ksi}$

Ultimate Bearing Strength of 6061-T651 aluminum (Ref. Mil-Hdbk-5H). $F_{bru_6061} := 67 \cdot \text{ksi}$

Ultimate vertical load at C. $p_{zu_c} = 2667 \cdot \text{lbf}$

$A_s := 2 \cdot \left(d_c - \frac{D_c}{2} \right) \cdot w$ Effective shear tear-out area. $A_s = 0.88 \cdot \text{in}^2$

$f_s := \frac{p_{zu_c}}{A_s}$ Shear Stress at C. $f_s = 3.05 \cdot \text{ksi}$

$MS := \frac{F_{su_6061}}{f_s} - 1$ Shear Margin of Safety $MS = 7.9$

$A_{br} := D_c \cdot w$ Effective bearing area. $A_{br} = 0.37 \cdot \text{in}^2$

$f_{br} := \frac{p_{zu_c}}{A_{br}}$ Bearing Stress at C. $f_{br} = 7.11 \cdot \text{ksi}$

$MS := \frac{F_{bru_6061}}{f_{br}} - 1$ Bearing Margin of Safety $MS = 8.4$

MOUNTING PLATES

The mounting plates must also withstand the maneuvering and drag loads acting together.

$$\text{Ultimate maneuvering load applied to beam} \quad P_{\text{ult_ext}} = 1047 \cdot \text{lbf}$$

$$\text{Ultimate drag load applied to each beam} \quad P_{\text{drag_beam}} = 276 \cdot \text{lbf}$$

The rear attachment is "floating", that is the basket is free to slide along a bushing (to allow for fit between a 206L and 407). As such, it cannot support the drag load. The forward attachment is critical.

The attachment from the basket to the plates uses two AN3 bolts through lugs in the bottom frame of the basket. The maneuvering load is applied as double shear to the bolts. The maneuvering and drag loads are equally distributed to each bolt.

Fastener Strength AN3 Bolt (Ref. Mil-Hdbk-5J):

$$\text{Ultimate Tensile Strength of AN3 Bolt (Ref. Mil-Hdbk-5J).} \quad P_{\text{tu_AN3}} := 2255 \cdot \text{lbf}$$

$$\text{Ultimate Shear Strength of AN3 Bolt (Ref. Mil-Hdbk-5J).} \quad P_{\text{su_AN3}} := 2125 \cdot \text{lbf}$$

$$P_{\text{zu_bolt}} := \frac{P_{\text{ult_ext}}}{2}$$

$$\text{Ultimate vertical load on AN3 bolt.} \quad P_{\text{zu_bolt}} = 523 \cdot \text{lbf}$$

$$\text{Ultimate Shear Strength of AN3 Bolt.} \quad P_{\text{su_AN3}} = 2125 \cdot \text{lbf}$$

$$R_s := \frac{P_{\text{zu_bolt}}}{2 \cdot P_{\text{su_AN3}}}$$

$$\text{Shear Stress Ratio for AN3 Bolt.} \quad R_s = 0.12$$

$$P_{\text{du_bolt}} := \frac{P_{\text{drag_beam}}}{2}$$

$$\text{Ultimate Drag load on AN3 bolt.} \quad P_{\text{du_bolt}} = 138 \cdot \text{lbf}$$

$$\text{Ultimate Tensile Strength of AN3 Bolt.} \quad P_{\text{tu_AN3}} = 2255 \cdot \text{lbf}$$

$$R_t := \frac{P_{\text{du_bolt}}}{P_{\text{tu_AN3}}}$$

$$\text{Tensile Stress Ratio for AN3 Bolt.} \quad R_t = 0.06$$

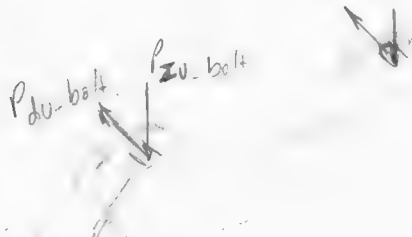
$$R := R_t^2 + R_s^3$$

$$\text{Combined Stress Ratio for AN3 Bolt.} \quad R = 0.006$$

$$\text{Where stress factor: } N := 7.5 \quad \text{Then: } (N \cdot R_s)^3 + (N \cdot R_t)^2 = 1.00 \quad (\text{must} = 1)$$

$$MS := N - 1$$

$$\text{Ultimate Margin of Safety (Ref. Mil-Hdbk-5E, 1.5.3.5)} \quad MS = 6.50$$



The maneuvering load causes bearing on the mounting plates. The mounting plates are made from 0.125" thick 2024-T3 sheet.

Shear load on each screw.

$$P_{zu_bolt} = 523 \cdot \text{lbf}$$

$$P_{br} := \frac{P_{zu_bolt}}{2}$$

Ultimate bearing load on each plate.

$$P_{br} = 262 \cdot \text{lbf}$$

$$A_{br} := 0.125 \cdot \text{in} \cdot 0.188 \cdot \text{in}$$

Bearing area

$$A_{br} = 0.024 \cdot \text{in}^2$$

$$f_{br} := \frac{P_{br}}{A_{br}}$$

Bearing stress on mounting plate

$$f_{br} = 11.1 \cdot \text{ksi}$$

Ultimate bearing strength of 2024-T3
(Ref: MIL-HDBK-5J)

$$F_{bru_2024} := 125 \cdot \text{ksi}$$

$$MS := \frac{F_{bru_2024}}{f_{br}} - 1$$

Ultimate Margin of Safety

$$MS = 10.23$$

The drag load causes bending on the mounting plate. Since the top edges are clamped tight against the basket lugs and the bottom against the beam, the slopes and deflections of the mounting plate on the forward and aft side of the beam must be the same. Assuming the entire drag load is applied to the inboard attachment as a simple cantilever, with an assumed effective width of 1.5" centred on the bolt hole:

Ultimate drag load applied to each beam.

$$P_{drag_beam} = 276 \cdot \text{lbf}$$

$$P_{drag_plate} := \frac{P_{drag_beam}}{2}$$

Drag load applied to each plate.

$$P_{drag_plate} = 138 \cdot \text{lbf}$$

Distance between basket attachment and beam attachment.

$$d_{plate} := 1.5 \cdot \text{in}$$

$$M_{strip} := P_{drag_plate} \cdot d_{plate}$$

Bending moment on effective strip.

$$M_{strip} = 207 \cdot \text{in} \cdot \text{lbf}$$

Properties of effective strip

Distance from centroid to outer edge.

$$y := 0.063 \cdot \text{in}$$

$$I_{x_strip} := \frac{1.5 \cdot \text{in}}{12} \cdot (0.125 \cdot \text{in})^3$$

Moment of inertia of strip.

$$I_{x_strip} = 0.000244 \cdot \text{in}^4$$

Bending of effective strip

$$f_{b_strip} := \frac{M_{strip} \cdot y}{I_{x_strip}}$$

Ultimate bending stress on strip.

$$f_{b_strip} = 53.5 \cdot \text{ksi}$$

Ultimate tensile strength of 2024-T3
(Ref: MIL-HDBK-5J)

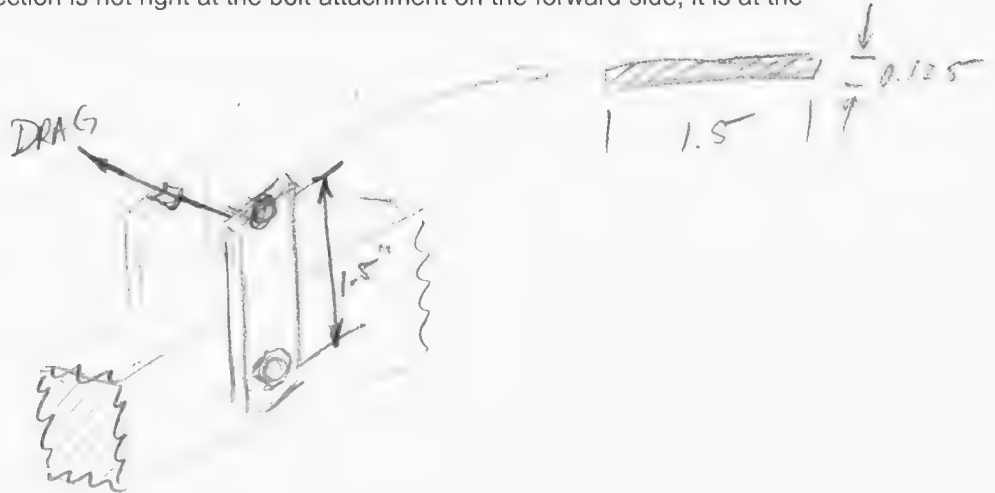
$$F_{tu_2024} := 62 \cdot \text{ksi}$$

$$MS := \frac{F_{tu_2024}}{f_{b_strip}} - 1$$

Ultimate Margin of Safety

$$MS = 0.16$$

This margin is considered conservative because the outboard attachment would be effective in carrying a part of the load, and the point of deflection is not right at the bolt attachment on the forward side, it is at the top of the beam.

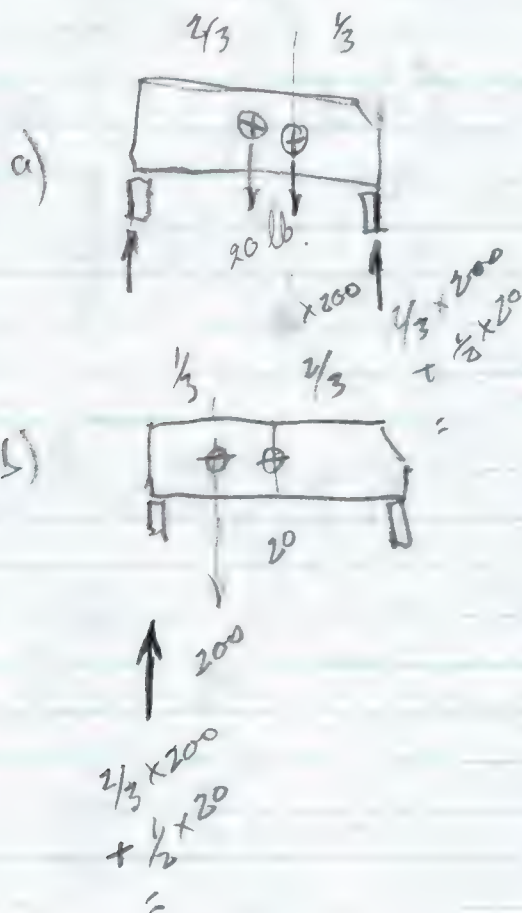


loads

Assumptions

i) Down loads

- basket weight equally distributed between beams.
- Cargo load on each of fwd & aft beam to be $\frac{2}{3}$ of total weight
- beam weight at beam C of G.



loads

Assumptions

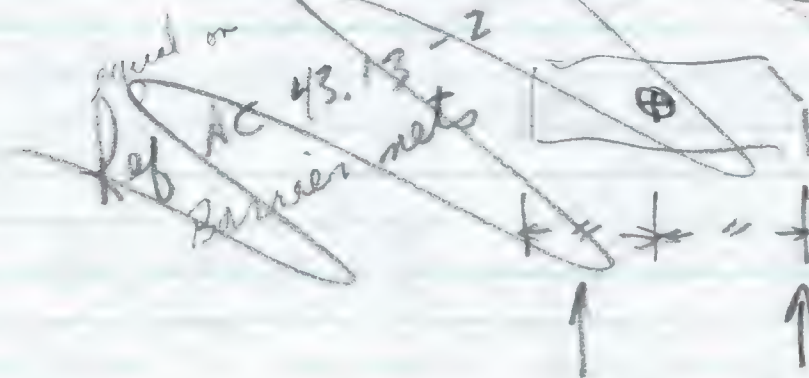
- 1) Downward loads - Limit / Ultimate Manoeuvring

~~Horizontal~~
Basket weight distributed by statics
equal or ~~equal~~ beam.



Cargo load

- a) ~~determine distributed by statics~~



- b) ~~reverse~~ load on rear beam
and front beam to $\frac{2}{3}$ of total
cargo or a) above
to be conservative

Beam weight

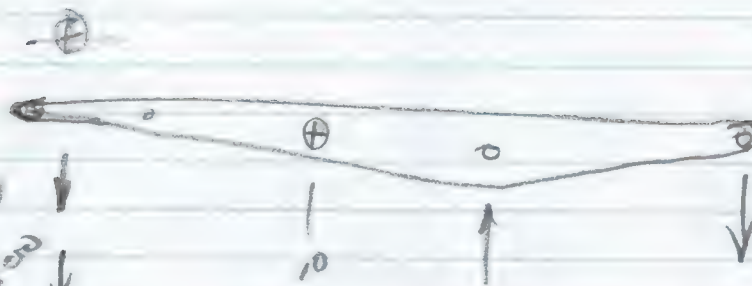
at beam c/gb.

ALT BEAM

static 1g

Bucket 20
load $\frac{2}{3} \times 200$

10×3.5



Limit maneuver

$3.5 \times [20 + \frac{2}{3} \times 200]$

ULT MANUEVERING

Aero Design

From: "Staal, Jack" <STAALJ@tc.gc.ca>
To: "Aerodesign (E-mail)" <aerodesign@telusplanet.net>
Sent: Friday, November 19, 2004 3:28 PM
Subject: FW: 407 Heli-Ski Basket changes

Ted,

4g forward would be accepted in this case..

Thanks
 Jack Staal

-----Original Message-----

From: Staal, Jack
Sent: Tuesday, November 16, 2004 5:09 PM
To: 'E. Burgoin'
Cc: Wright, Fred
Subject: RE: 407 Heli-Ski Basket changes

Ted / Fred:

There is a crucial "not" missing in the previous email. "...amendment 30 does not limit..." and added in bold below.

HQ has indicated there are errors on the TCDS H-92 with respect to 27.561(b)(3) as being amendment 24. I am checking further whether this affects 27.561(c) as well.

It may well be that we can go with 4g fwd, but let me confirm this.

Thanks,

J.H. (Jack) Staal
 Aircraft Certification Technologist | Technologue, Certification des aeronefs.
 Prairie and Northern Region | Region des Prairies et du Nord

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 TTY / ATS : 1-888-675-6863

Transport Canada | Transports Canada
 1100- 9700, Jasper Avenue | avenue Jasper (RAED)
 Edmonton, AB T5J 4E6
 Government of Canada | Gouvernement du Canada

-----Original Message-----

From: Staal, Jack
Sent: Tuesday, November 16, 2004 3:29 PM
To: 'E. Burgoin'
Cc: Wright, Fred
Subject: RE: 407 Heli-Ski Basket changes

Hi Ted,

The 8g did not come from 27.561(b)(3).

FAR 27 to amendment 30 applies with the exceptions noted in the Type Certificate H-92. This includes paragraph 27.787 which was amended at 27-27. FAR 27.787 refers to 27.561. To get a better idea of the reasons for amending 27.787 the preamble for the amendment is referenced. "The proposal would also clarify that the requirement can be

met either by containing the cargo and baggage not to injure occupants **or impede emergency egress when subjected to emergency landing loads.**" Referring the the final rule action "Other than minor editorial changes, the amendment is adopted as proposed."

FAR 27 amemdment 30 includes 27.561(c) which is at amendment 27-30, and was last amended by 27-25. Item 27.561(c) at amendment 30 does **not** limit the occupant protection or emergency egress criteria, noted above as the intent of the rule, to restraint of rotors, transmissions, or engines. "Items of mass must be restrained to 8g forward".

As regards the exits 27.807 would have to documented as complied with.

Sincerely,

J.H. (Jack) Staal

Aircraft Certification Technologist | Technologue, Certification des aeronefs.
Prairie and Northern Region | Region des Prairies et du Nord

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Transport Canada | Transports Canada
1100- 9700, Jasper Avenue | avenue Jasper (RAED)
Edmonton, AB T5J 4E6
Government of Canada | Gouvernement du Canada

-----Original Message-----

From: E. Burgoin [mailto:ted.aerodesign@telusplanet.net]

Sent: Monday, November 08, 2004 4:50 PM

To: Staal, Jack

Subject: Fw: 407 Heli-Ski Basket changes

----- Original Message -----

From: E. Burgoin

To: Staal, Jack

Sent: Thursday, November 04, 2004 2:46 PM

Subject: 407 Heli-Ski Basket changes

Jack:

Please advise your comments on the 407 "pop-out window" situation and the 8g forward condition.

Ted.

5 1/2 RIN T.

KENT
DRAPER



407 FIT



407
Mike

27 $\frac{3}{8}$
30 $\frac{3}{8}$

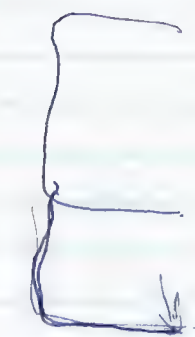
58 $\frac{1}{2}$

25

x x

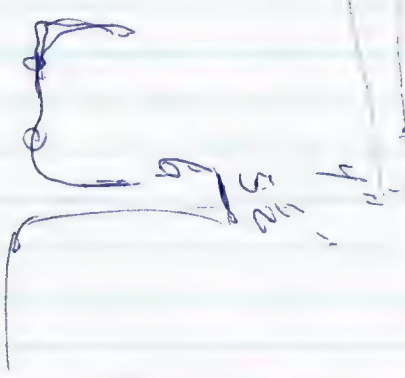
2

16

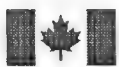


58 $\frac{1}{2}$

↓



2/4



Type Certificate Data Sheet

(Continuation Sheet)

Number: H-92 Issue 17

Rotor Limits

Power Off

Maximum 442 R.P.M. 107%

Minimum 351 R.P.M. 85%

Power On

Maximum 413 R.P.M. 100%

Minimum 409 R.P.M. 99%

Airspeed Limits

(See Rotorcraft Flight Manual as listed in Approved Publications)

C.G. Limits

(See NOTE 12)

Basic Aircraft

Longitudinal C.G. Limits cm (in.)

Forward Limit (Internal Loading)

302.3 cm (+119.0 in.) up to 2041 kg (4,500 lb.) changing linearly to 303.5 cm (+119.5 in.) at 2268 kg (5,000 lb.)

Aft Limit (Internal Loading)

327.7 cm (+129.0 in) up to 2268 kg (5,000 lb.)

Lateral C.G. Limits (Internal Loading)

Left -6.4 cm (-2.5 in.) up to 1588 kg (3,500 lb.), changing linearly to -3.9 cm (-1.5 in.) at 2268 kg (5,000 lb.)

Right 7.6 cm (3.0 in.) up to 1588 kg (3,500 lb.) changing

Linearly to 5.2 cm (2.0 in.) at 2268 kg (5,000 lb.)

Aircraft when kit 407-706-020 (5250 lb kit) is installed

Longitudinal C.G. Limits cm (in.)

Forward Limit (Internal Loading)

302.3 cm (+119.0 in.) up to 2041 kg (4,500 lb.) changing linearly to 304.2 cm (+119.8 in.) at 2381 kg (5,250 lb.)

Aft Limit (Internal Loading)

327.7 cm (+129.0 in) up to 2268 kg (5,000 lb.) Changing linearly to 326.8 cm (128.7 in) at 2381 kg (5,250 lb.)

Lateral C.G. Limits (Internal Loading)

Left -6.4 cm (-2.5 in.) up to 1588 kg (3,500 lb.), changing linearly to -3.5 cm (-1.4 in.) at 2381 kg (5,250 lb.)

Right 7.6 cm (3.0 in.) up to 1588 kg (3,500 lb.) changing

Linearly to 4.8 cm (1.9 in.) at 2381 kg (5,250 lb.)

$$y = mx + b$$

$$3 = m(3500) + b$$

$$2 = m(5000) + b$$

$$1 = -1500m$$

$$m = -0.000667$$

$$3 = -0.000667 \cdot 3500 + b$$

$$b = 5.333$$

$$y = -0.000667x + 5.333$$



Type Certificate Data Sheet

(Continuation Sheet)

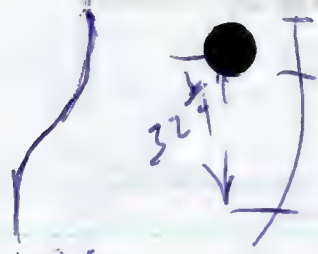
Number: H-92 Issue 17

C.G. Limits (Cont'd) See NOTE 12	<u>External Loading Limits for basic aircraft or when kit 407-706-020 is installed:</u> Longitudinal C.G. Limits cm (in.) Forward Limit (External Loading) 302.3 cm (+119.0 in.) up to 2041 kg (4,500 lb.) changing Linearly to 306.1 cm (+120.5 in.) at 2722 kg (6,000 lb.) Aft Limit (External Loading) 327.7 cm (+129.0 in.) up to 2268 kg (5,000 lb.) changing linearly to 324.1 cm (+127.6 in.) at 2722 kg (6,000 lb.) Lateral C.G. Limits (External Loading) Left -10.2 cm (-4.0 in.) up to 2268 kg (5,000 lb.), -3.9 cm (-1.5 in.) at 2268 kg (5,000 lb.), changing linearly to -2.3 cm (-0.9 in.) at 2722 kg (6,000 lb.) Right 10.2 cm (4.0 in.) up to 2268 kg (5,000 lb.) 5.2 cm (2.0 in.) at 2268 kg (5,000 lb.), changing linearly to 3.6 cm (1.4 in.) at 2722kg (6,000 lb.)
Maximum Weight (Mass)	2268 kg (5,000 lb.) (Internal loading) 2381 kg (5,250 lb.) (Internal Loading) when equipped with kit 407-706-020. 2722 kg (6,000 lb.) (External Loading) (See NOTE 17 for external cargo configuration information)
Altitude Limits	Maximum altitude is 20,000 ft. density altitude. For other altitude limitations refer to Rotorcraft Flight Manual Supplements.
Minimum Crew	1 pilot
Maximum Occupants	7 (includes crew)
Maximum Cargo	Refer to Rotorcraft Flight Manual for loading schedule.
Fuel Capacity	483.7 litres (106.4 Imp. Gal) (127.8 US Gal.) usable, 10.0 litres (2.21 Imp. Gal) (2.65 US Gal.) Unusable.
Oil Capacity	5.21 litres (4.58 Imp. quarts) (5.5 US quarts); usable oil 2 US quarts included in capacity. Undrainable oil, 1.6 lbs.
Serial Numbers Eligible (See	53000-53279, 53281-53003, 53005 and subsequent.

BEAMS

Hanging Load

$3.5 \times 1.5 = 5.25$



$\frac{2}{3}$ on aft beam.

DRAG

$\frac{1}{2}$ on each beam

CASE 1

BASKET

Sideward in basket

Previous report

- show that contents don't come out

Upward on line

Previous report

- show contents don't come out

Tests

DRAG

wire outwards by 4"

- ~~drag split between~~ or all load on one beam.

$$\begin{array}{r} 324 \\ \times 484 \\ \hline \end{array}$$

310

= 271 @ 324 inches
take and fitting

Got 920 when did again w/Steven.

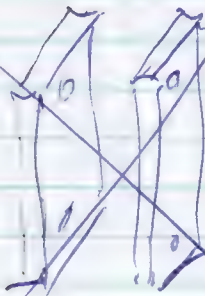
275.8 @ 312.5 284.7 @ 312.5

Basket

Number to Drag -

- Test - person 362

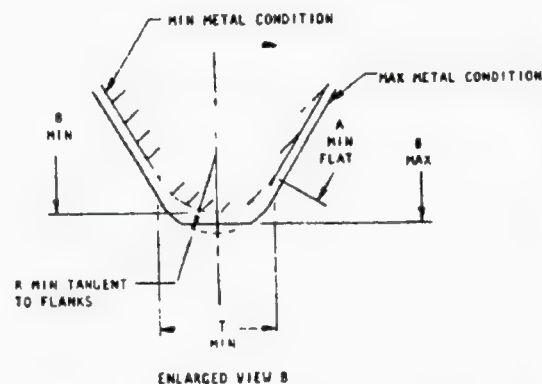
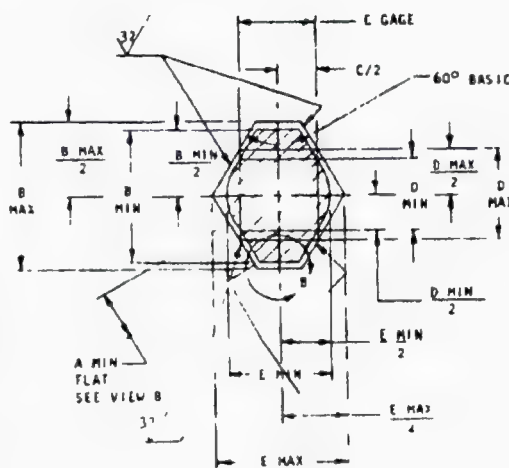
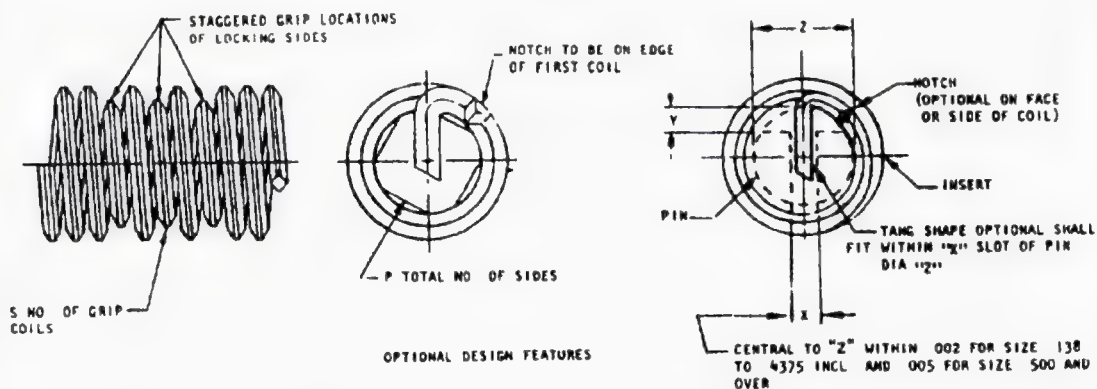
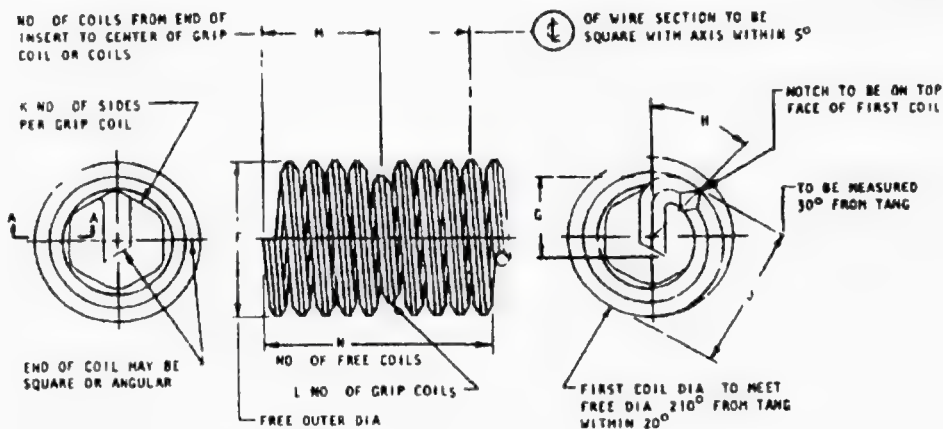
~~Back~~



Feed



3/8 FINE
MIN 1/2" long



SECT A-A

FOR CHANGES SEE SHEETS 4 AND 5

This military standard is approved for use by all Departments and Agencies of the Department of Defense. Selection for all new engineering and design applications and for repetitive use shall be made from this document, when applicable.

P.A. USAF - 11	TITLE	MILITARY STANDARD
Other Code Army - AV	INSERT SCREW THREAD COARSE AND FINE SCREW LOCKING HELICAL COIL GRES	MS21209
PROCUREMENT SPECIFICATION MIL I 8840	SUPERSEDES	SHEET 1 OF 5

DD FORM 672-1 (Coordinated)

EDITION OF 1 SEP 67 MAY BE USED

1701 0 5140 1270

APPROVED 17 Jul 61 REVISED A 12 Jan 66 B 20 Jun 66 C 28 Jun 74 D 20 Nov 72 E 21 Feb 78

MOORE'S
CALGARY FASTENER

M+M SHOULD HAVE STOCK ON THESE

COARSE THREAD SERIES

PED SUP CLASS
5340

1 DIAMETER NOMINAL LENGTH						1 5 DIAMETER NOMINAL LENGTH					
NOMINAL THREAD SIZE	DASH NO	LENGTH (REF)	WEIGHT LBS/100	M +1 COIL	N +1/4 COIL	DASH NO	LENGTH (REF)	WEIGHT LBS/100	M +1 COIL	N +1/4 COIL	
086-56	C0210	086	0051	1 500	3 00	C0215	129	0084	2 625	5 250	
099-48	C0310	099	0077	1 4375	2 875	C0315	148	0125	2 500	5 000	
112-40	C0410	112	0121	1 375	2 750	C0415	168	0196	2 375	4 750	
125-40	C0510	125	0154	1 625	3 250	C0515	188	0250	2 250	5 500	
138-32	C0610	138	0243	1 375	2 750	C0615	207	0384	2 375	4 750	
164-32	C0810	164	0355	1 750	3 500	C0815	246	0556	3 000	6 000	
190-24	C1-10	190	0573	1 4375	2 875	C1-15	285	0899	2 500	5 000	
216-24	C2-10	216	077	1 750	3 500	C2-16	324	119	3 000	6 000	
250-20	C4-10	250	145	1 6875	3 375	C4-15	375	196	2 875	5 750	
3125-18	C5-10	3125	232	2 000	4 000	C5-15	469	369	3 125	6 250	
375-16	C6-10	375	391	2 1875	4 375	C6-15	562	625	3 625	7 250	
4375-14	C7-10	4375	662	2 250	4 500	C7-15	656	941	3 6875	7 375	
500-13	C8-10	500	794	2 4375	4 875	C8-15	750	1 316	3 9375	7 875	
5625-12	C9-10	5625	1 235	2 5625	5 125	C9-15	844	1 961	4 125	8 250	
625-11	C1010	625	1 515	2 6250	5 250	C1015	938	2 439	4 250	8 500	
750-10	C1210	750	2 778	2 9375	5 875	C1215	1 125	4 000	4 6875	9 375	
875-9	C1410	875	4 545	3 125	6 250	C1415	1 312	6 250	5 000	10 000	
1 000-8	C1610	1 000	5 882	3 1875	6 375	C1615	1 500	9 091	5 0625	10 125	
1 125-7	C1810	1 125	8 392	3 0625	6 125	C1815	1 688	12 928	4 9375	9 875	
1 250-7	C2010	1 250	10 487	3 500	7 000	C2015	1 875	16 070	5 625	11 250	
1 375-6	C2210	1 375	14 505	3 250	6 500	C2215	2 062	22 264	5 250	10 500	
1 500-6	C2410	1 500	17 563	3 625	7 250	C2415	2 250	26 915	5 750	11 500	

2 DIAMETER NOMINAL LENGTH						2 5 DIAMETER NOMINAL LENGTH					
NOMINAL THREAD SIZE	DASH NO	LENGTH (REF)	WEIGHT LBS/100	M +1 COIL	N +1/4 COIL	DASH NO	LENGTH (REF)	WEIGHT LBS/100	M +1 COIL	N +1/4 COIL	
086-56	E0220	172	0117	3 6875	7 375	C0225	215	015	5 9375	9 625	
099-48	C0320	198	0174	3 625	7 250	C0325	248	0224	5 750	9 375	
112-40	C0420	224	0272	3 375	6 750	C0425	280	0348	5 500	8 875	
125-40	C0520	250	0345	3 875	7 750	C0525	312	044	6 125	10 000	
138-32	C0620	276	0525	3 4375	6 875	C0625	345	0666	5 4375	8 875	
164-32	C0820	328	0776	4 1875	8 375	C0825	410	1008	6 5625	10 750	
190-24	C1-20	380	1330	3 5625	7 125	C1-25	475	172	5 6875	9 250	
216-24	C2-20	432	172	4 1875	8 375	C2-25	540	208	6 4375	10 625	
250-20	C4-20	500	308	4 000	8 000	C4-25	625	385	6 375	10 375	
3125-18	C5-20	625	510	4 625	9 250	C5-25	781	658	7 250	11 875	
375-16	C6-20	750	867	5 000	10 000	C6-25	938	1 064	7 875	12 875	
4375-14	C7-20	875	1 250	5 125	10 250	C7-25	1 094	1 667	8 000	13 125	
500-13	C8-20	1 000	1 852	5 500	11 000	C8-25	1 250	2 273	8 625	14 125	
5625-12	C9-20	1 125	2 632	5 750	11 500	C9-25	1 406	3 226	9 000	14 750	
625-11	C1020	1 250	3 448	5 875	11 750	C1025	1 562	4 348	9 125	15 000	
750-10	C1220	1 500	5 263	6 500	13 000	C1225	1 875	6 667	10 000	16 500	
875-9	C1420	1 750	8 333	6 875	13 750	C1425	2 188	10 000	10 625	17 500	
1 000-8	C1620	2 000	12 500	7 000	14 000	C1625	2 500	14 286	10 750	17 750	
1 125-7	C1820	2 250	17 464	6 8125	13 625	C1825	2 812	22 000	10 6875	17 500	
1 250-7	C2020	2 500	21 653	7 6875	15 375	C2025	3 125	27 236	11 8125	19 500	
1 375-6	C2220	2 750	30 122	7 1875	14 375	C2225	3 438	37 981	11 1875	18 375	
1 500-6	C2420	3 000	36 768	7 9375	15 875	C2425	3 750	45 620	12 1875	20 125	

3 DIAMETER NOMINAL LENGTH					
NOMINAL THREAD SIZE	DASH NO	LENGTH (REF)	WEIGHT LBS/100	M +1 COIL	N +1/4 COIL
086-56	C0230	258	0183	8 1875	11 875
099-48	C0330	297	0271	7 875	11 500
112-40	C0430	336	0423	7 500	10 875
125-40	C0530	375	0516	8 375	12 250
138-32	C0630	414	0807	7 4375	10 750
164-32	C0830	492	125	9 0625	13 250
190-24	C1-30	570	219	7 8125	11 375
216-24	C2-30	648	279	8 9375	13 125
250-20	C4-30	750	490	8 750	12 750
3125-18	C5-30	938	806	10 000	14 625
375-16	C6-30	1 125	1 316	10 875	15 750
4375-14	C7-30	1 312	2 000	11 000	16 125
500-13	C8-30	1 500	2 857	11 625	17 125
5625-12	C9-30	1 688	4 000	12 125	17 875
625-11	C1030	1 875	5 263	12 500	13 375
750-10	C1230	2 250	8 333	13 625	20 125
875-9	C1430	2 625	12 500	14 375	21 250
1 000-8	C1630	3 000	16 670	14 625	21 625
1 125-7	C1830	3 375	26 536	14 4375	21 250
1 250-7	C2030	3 750	32 819	16 0625	23 750
1 375-6	C2230	4 125	45 839	15 0625	22 250
1 500-6	C2430	4 500	54 972	16 5625	24 500

P.A. USAF - 11	TITLE	MILITARY STANDARD
Other Cust	1 INCH 5/16 THRU 1 1/2 INCH HELICAL COIL CRES	MS21209
Army - AV		
PROCUREMENT SPECIFICATION MIL-1-8846	SUPERSEDES	SHEET 2 OF 4

DD FORM 672-1 (Coordinated)

EDITION OF 1 SEP 57 MAY BE USED

APPROVED 17 JUL 61 REVISE (E) 21 Feb 76

This military standard is approved for use by all Departments and Agencies of the Department of Defense. Selection for all new applications and for repetitive use shall be made from this document, when applicable.

Review Activities: Army - MI, AR, EL; Navy - AS, OS; Air Force - DLA - 13

User Activities: Army - AS, OS; Navy - AS, OS; Air Force - DLA - 13

FINE THREAD SERIES

FED SUP CLASS

5340

1 5 DIAMETER NOMINAL LENGTH						1 5 DIAMETER NOMINAL LENGTH					
NOMINAL THREAD SIZE	DASH NO	LENGTH (REF)	WEIGHT LBS/100	N +1 COIL	N +1/4 COIL	DASH NO	LENGTH (REF)	WEIGHT LBS/100	N +1 COIL	N +1/4 COIL	
099-56	F0310	099	0081	1 6875	3 375	F0315	148	0084	2 8125	5 625	
112-48	F0410	112	0099	1 6875	3 375	F0415	168	0160	2 8125	5 625	
138-40	F0610	138	010	1 750	3 500	F0615	207	0304	3 000	6 000	
164-36	F0810	164	0325	1 9375	3 875	F0815	246	0502	1 250	6 500	
190-32	F1-10	190	0474	2 0625	4 125	F1-15	285	0784	3 4375	6 875	
250-28	F4-10	250	109	2 500	5 000	F4-15	375	155	4 125	8 250	
3125-24	F5-10	312	180	2 750	5 500	F5-15	469	284	4 4375	8 875	
375-24	F6-10	375	259	1 4375	6 875	F6-15	562	420	5 500	11 000	
4375-20	F7-10	438	459	1 3125	6 675	F7-15	656	699	5 3125	10 625	
500-20	F8-10	500	595	1 9375	7 875	F8-15	750	909	4 1875	12 375	
5625-18	F9-10	562	826	4 000	8 000	F9-15	844	1 266	6 250	12 500	
625-18	F1010	625	1 010	4 500	9 000	F1015	938	1 562	7 0625	14 125	
750-16	F1210	750	1 495	4 875	9 750	F1215	1 125	2 564	7 5625	15 125	
875-14	F1410	875	2 564	4 9375	9 875	F1415	1 312	4 000	7 750	15 500	
1 000-12	F1610	1 000	3 875	4 8125	9 625	F1615	1 500	6 063	7 500	15 000	
1 125-12	F1810	1 125	4 917	5 5625	11 125	F1815	1 688	7 572	8 625	17 250	
1 250-12	F2010	1 250	6 254	6 250	12 500	F2015	1 875	9 502	4 6875	19 375	
1 375-12	F2210	1 375	7 359	6 875	13 750	F2215	2 062	11 276	10 6875	21 375	
1 500-12	F2410	1 500	8 799	7 625	15 250	F2415	2 250	13 850	11 750	23 500	

2 5 DIAMETER NOMINAL LENGTH						2 5 DIAMETER NOMINAL LENGTH					
NOMINAL THREAD SIZE	DASH NO	LENGTH (REF)	WEIGHT LBS/100	N +1 COIL	N +1/4 COIL	DASH NO	LENGTH (REF)	WEIGHT LBS/100	N +1 COIL	N +1/4 COIL	
099-56	F0320	198	0117	4 000	8 000	F0325	240	0192	6 375	10 375	
112-48	F0420	224	0222	3 9375	7 875	F0425	280	0285	6 3125	10 250	
138-40	F0620	276	0408	4 1875	8 375	F0625	345	0512	6 5625	10 750	
164-36	F0820	328	0680	4 5625	9 125	F0825	410	0857	7 0625	11 625	
190-32	F1-20	360	112	4 750	9 500	F1-25	475	140	7 500	12 000	
250-28	F4-20	400	212	5 6875	11 375	F4-25	625	276	8 8125	14 500	
3125-24	F5-20	625	397	6 125	12 250	F5-25	781	490	9 500	15 625	
375-24	F6-20	750	553	7 500	15 000	F6-25	938	709	11 625	19 125	
4375-20	F7-20	875	917	7 3125	14 625	F7-25	1 094	1 250	11 1875	18 500	
500-20	F8-20	1 000	1 234	8 4375	16 875	F8-25	1 250	1 563	12 5375	21 375	
5625-18	F9-20	1 125	1 695	8 5625	17 125	F9-25	1 406	2 128	13 1875	21 750	
625-18	F1020	1 250	2 083	9 625	19 250	F1025	1 562	2 632	14 625	24 250	
750-16	F1220	1 500	3 448	10 3125	20 625	F1225	1 875	4 348	15 6875	26 000	
875-14	F1420	1 750	5 263	10 5625	21 125	F1425	2 188	6 667	16 0625	26 625	
1 000-12	F1620	2 000	8 188	10 750	20 500	F1625	2 500	10 406	15 750	26 000	
1 125-12	F1820	2 250	10 227	11 6875	23 375	F1825	2 812	12 882	17 8125	28 500	
1 250-12	F2020	2 500	12 750	13 125	26 250	F2025	3 125	15 998	19 875	33 000	
1 375-12	F2220	2 750	15 194	14 4375	28 875	F2225	3 438	18 111	22 0625	36 500	
1 500-12	F2420	3 000	18 571	15 8125	31 625	F2425	3 750	23 352	24 0625	39 875	

3 DIAMETER NOMINAL LENGTH					
NOMINAL THREAD SIZE	DASH NO	LENGTH (REF)	WEIGHT LBS/100	N +1 COIL	N +1/4 COIL
099-56	F0330	297	0234	8 625	12 625
112-48	F0430	336	0346	8 5625	12 500
138-40	F0630	414	0616	9 0625	13 250
164-36	F0830	492	1034	9 6875	14 350
190-32	F1-30	570	170	10 125	14 875
250-28	F4-30	750	338	11 9375	17 625
3125-24	F5-30	938	602	12 875	19 000
375-24	F6-30	1 125	862	15 625	23 125
4375-20	F7-30	1 312	1 493	15 1875	22 500
500-20	F8-30	1 500	1 857	17 4375	25 875
5625-18	F9-30	1 688	2 564	17 6875	26 250
625-18	F1030	1 875	3 032	19 750	29 375
750-16	F1230	2 250	5 263	21 1875	31 500
875-14	F1430	2 625	7 692	21 6875	32 250
1 000-12	F1630	3 000	12 815	21 750	31 500
1 125-12	F1830	3 375	15 536	24 0625	35 750
1 250-12	F2030	3 750	19 246	26 750	39 875
1 375-12	F2230	4 125	23 028	29 5625	44 000
1 500-12	F2430	4 500	26 203	32 3125	48 125

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Approved: 17 Jul 61
Revised: E 21 Feb 78

P A US-F-11

Other Code
Army - AV

TITLE

INSERT SCREW THREAD, CO-45, AND FINE SCREW DOWEL
HELICAL COIL LBS

MILITARY STANDARD

MS 21209

PROCUREMENT SPECIFICATION
MIL-1-8346

SUPERSEDES

SHEET OF

DD FORM 672-1 (Coordinated)

EDITION OF 1 SEP 67 MAY BE USED

FED SUP CLASS
5340

INSERT DIMENSIONS COARSE THREAD

NOMINAL THREAD SIZE	A MIN	B MIN	C MAX	D GAGE	E MIN	F MAX	G MIN	H MAX	I MIN	J MAX
086-56	0027	0161	0191	00891	0112	0116	0126	0156	110	115
099-48	0041	0196	0226	01042	01313	01353	0152	0182	128	137
112-40	0068	0241	0271	0125	01584	01624	0185	0219	148	159
125-40	0068	0241	0271	0125	01584	01624	0185	0219	158	173
138-32	0076	0295	0338	01561	01985	02030	0233	0273	178	193
164-32	0076	0295	0338	01561	01985	02030	0233	0273	205	220
190-24	0120	0410	0449	02083	02656	02706	0305	0365	244	259
216-24	0120	0410	0449	02083	02656	02706	0305	0365	270	285
250-20	0164	050	0540	02500	03198	03248	0378	0438	310	330
3125-18	0176	056	060	02778	03558	03608	0416	0486	380	400
375-16	0215	0636	0677	03125	04009	04059	0477	0547	452	472
4375-14	0267	0730	0770	03571	04589	04639	0545	0625	526	551
500-13	0273	0758	0829	03846	04946	04996	0591	0671	597	622
5625-12	0334	0861	0900	04167	05163	05213	0619	0729	669	694
625-11	0351	0909	0980	04545	05555	05605	0655	0755	743	767
750-10	0462	1007	1079	05000	06445	06495	0795	0875	881	906
875-9	0466	1124	1199	05556	07167	07217	0892	0972	1032	1057
1000-8	0544	1264	1350	06350	08069	08119	1004	1094	1166	1196
1125-7	0645	1451	1546	07143	09229	09279	1160	1250	1315	1355
1250-7	0645	1451	1546	07143	09229	09279	1160	1250	1443	1483
1375-6	0775	1695	1799	08333	10775	10825	1368	1458	1598	1643
1500-6	0775	1695	1799	08333	10775	10825	1368	1458	1727	1772

NOMINAL THREAD SIZE	G		H		J		K	L	P	S ±1/4 E611	R MIN	T MIN	
	MIN	MAX	MIN	MAX	MIN	MAX							
086-56	067	085	75*	150*	103	111	4	1	3	1	50	0032	0056
099-48	070	090	75*	150*	128	137	4	1	3	1	50	0038	0065
112-40	070	105	25*	100*	144	159	4	1	3	1	75	0045	0075
125-40	078	108	25*	100*	158	173	4	1	3	1	62	0045	0078
138-32	091	135	25*	100*	178	193	4	1	3	1	75	0056	0098
164-32	117	152	20*	100*	205	220	4	1	3	1	75	0056	0098
190-24	138	183	20*	90*	244	259	4	1	3	1	75	0075	0130
216-24	104	189	20*	90*	270	286	4	1	—	—	—	0075	0150
250-20	187	238	20*	80*	310	330	5	1	4	2	50	0090	0156
3125-18	227	291	20*	80*	380	400	5	1	3	2	75	0100	0174
375-16	291	354	20*	80*	452	472	6	1	3	2	75	0113	0195
4375-14	318	416	20*	80*	526	551	6	1	4	1	75	0129	0223
500-13	349	463	20*	80*	597	622	6	1	4	1	75	0139	0240
5625-12	401	521	20*	80*	656	676	6	1	4	1	75	0150	0260
625-11	428	572	20*	80*	727	747	6	1	5	2	25	0164	0284
750-10	453	635	60*	120*	840	885	6	1	5	2	25	0180	0312
875-9	506	734	60*	120*	991	1026	6	1	6	3	33	0200	0347
1000-8	526	781	60*	120*	1115	1170	6	1	6	3	33	0226	0391
1125-7	557	843	60*	120*	1260	1315	6	1	6	3	33	0258	0446
1250-7	679	937	60*	120*	1366	1416	6	1	6	3	33	0258	0446
1375-6	689	1093	60*	120*	1545	1598	7	1	6	3	33	0301	0521
1500-6	811	1187	60*	120*	1676	1727	7	1	6	3	33	0301	0521

NOMINAL THREAD SIZE	X + 001 - 000	Y + 001 - 000	Z + 000 - 001
086-56	-	-	-
099-48	-	-	-
112-40	-	-	-
125-40	-	-	-
138-32	045	020	101
164-32	045	020	127
190-24	061	020	142
216-24	064	025	168
250-20	073	028	193
3125-18	082	034	250
375-16	093	039	302
4375-14	112	056	355
500-13	125	076	411
5625-12	142	086	468
625-11	156	114	521
750-10	186	117	625
875-9	186	156	750
1000-8	250	156	844
1125-7	-	-	-
1250-7	-	-	-
1375-6	-	-	-
1500-6	-	-	-

NOMINAL THREAD SIZE	X + 001 - 000	Y + 001 - 000	Z + 000 - 001
099-56	-	-	-
112-48	-	-	-
138-40	-	-	-
164-36	-	-	-
190-32	052	020	153
250-28	060	020	208
3125-24	070	024	265
375-24	070	024	328
4375-20	088	046	382
500-20	090	046	422
5625-18	100	066	500
625-18	100	089	563
750-16	109	087	629
875-14	125	135	724
1000-12	-	-	-
1125-12	-	-	-
1250-12	-	-	-
1375-12	-	-	-
1500-12	-	-	-

Army - AF, AS, OS
User Activities
DA - 13

Army - AF, AS, OS
User Activities
DA - 13

This military standard is approved for use by all Departments
and Agencies for the design, development, and production of
new engineering and design applications and for repetitive use
shall be made from this document, when applicable

P.A. USAF - 11	TITLE	MILITARY STANDARD
Other Code	INSERT SCREW THREAD COARSE AND FINE SCREW LOCKING HELICAL COIL CRES	MS21209
Army - AV		
PROCUREMENT SPECIFICATION MIL-1-8846	SUPERSEDES	SHEET 4 OF

FED SUP CLASS
8340

INSERT DIMENSIONS FINE THREAD

NOMINAL THREAD SIZE	A MIN	B MIN	C MAX	GAGE MIN	D MAX	E MIN	F MAX	G MIN	H MAX
009-56	0027	0163	0193	00893	0112	0110	0126	0106	131
112-48	0043	0196	0226	01042	01313	0133	0152	0182	162
138-40	0068	0241	0271	01250	01584	01624	0189	0219	173
164-36	0093	0286	0301	01389	01764	01804	0203	0243	204
190-32	0076	0295	0338	01563	01985	02030	0233	0273	236
250-28	0085	0347	0387	01786	02270	02320	0253	0313	306
3125-24	0120	0410	0449	02083	02656	02706	0305	0365	380
375-24	0120	0410	0449	02083	02656	02706	0305	0365	448
4375-20	0164	500	0540	02500	03198	03248	0378	0438	524
500-20	0164	500	0540	02500	03198	03248	0378	0438	592
5625-18	0176	0560	0600	02778	03558	03608	0416	0486	664
625-18	0176	0560	0600	02778	03558	03608	0416	0486	732
750-16	0215	0636	0677	03125	04009	04059	0477	0547	876
875-14	0267	0730	0770	03571	04589	04639	0545	0625	1021
1000-12	0334	0861	0900	04167	05363	05413	0649	0729	1169
1125-12	0334	0861	0900	04167	05363	05413	0649	0729	1304
1250-12	0334	0861	0900	04167	05363	05413	0649	0729	1439
1375-12	0334	0861	0900	04167	05363	05413	0649	0729	1575
1500-12	0334	0861	0900	04167	05363	05413	0649	0729	1710

NOMINAL THREAD SIZE	MIN	G	MAX	MIN	H	MAX	MIN	J	MAX	K	L	P	S 1/4 COIL	R	T
009-56	072	090	75*	150*	131	146	4	1	1	1	1	1	0032	0056	
112-48	060	095	75*	150*	157	162	4	1	1	1	1	1	2.33	0038	0065
138-40	100	130	75*	100*	173	181	4	1	1	1	1	1	2.33	0045	0078
164-36	117	147	75*	100*	204	224	4	1	1	1	1	1	2.33	0050	0087
190-32	131	182	75*	90*	236	256	5	1	1	1	1	1	1.75	0056	0098
250-28	178	244	75*	75*	306	326	5	1	1	1	1	1	4.0	0064	0112
3125-24	209	291	75*	75*	380	400	6	2	9	1	1	1	5.25	0072	0130
375-24	240	353	75*	75*	448	468	6	2	10	5	25	10	5.25	0075	0130
4375-20	287	416	75*	75*	524	549	6	2	8	4	0	0	5.25	0090	0156
500-20	318	479	75*	75*	592	617	6	2	10	5	25	10	5.25	0090	0156
5625-18	354	541	75*	75*	666	691	6	2	10	5	25	10	5.25	0100	0174
625-18	386	588	75*	75*	733	758	6	2	10	5	25	10	5.25	0100	0174
750-16	464	557	75*	75*	876	901	7	2	12	6.25	0113	0195	0113	0195	
875-14	495	604	75*	75*	1021	1051	8	2	12	6.25	0129	0223	0129	0223	
1000-12	526	728	75*	75*	1169	1199	8	2	14	7.5	0150	0260	0150	0260	
1125-12	557	819	75*	75*	1304	1334	8	2	14	7.5	0150	0260	0150	0260	
1250-12	679	941	75*	75*	1344	1374	8	2	14	7.5	0150	0260	0150	0260	
1375-12	689	1001	75*	75*	1469	1504	10	2	14	7.5	0150	0260	0150	0260	
1500-12	811	1123	75*	75*	1594	1629	11	2	14	7.5	0150	0260	0150	0260	

NOMINAL LENGTH NOMINAL LENGTH EQUALS MINIMUM THROUGH HOLE LENGTH WITHOUT COUNTERSINK AND WITH INSERT LOCATED 1/4 TO 1/2
THREAD PITCH BELOW TOP SURFACE.

(E) FREE COILS THE NUMBER OF FREE COILS OF THE INSERT ARE COUNTED 90° FROM TANG FOR ALL SIZES

MATERIAL STEEL, CORROSION RESISTANT, SEE PROCUREMENT SPECIFICATION

THREAD THREAD MEETING THE REQUIREMENTS OF HANDBOOK H-28 AND SHALL ACCEPT EXTERNAL THREADED PARTS WHICH ARE THREADED
TO MIL-S-7742 OR MIL-S-8879

SURFACE ROUGHNESS: ANSI B46 1-1962

DIMENSIONS IN INCHES, APPLY BEFORE PLATING UNLESS OTHERWISE SPECIFIED. TOLERANCES LINEAR DIMENSIONS ± .010 ANGULAR

DIMENSIONS ± .5°

COLOR IDENTIFICATION

- (a) BARE INSERTS - DYED RED
- (b) DRY FILM LUBRICATED - DARK GREY
- (c) CADMIUM PLATED - OLIVE DRAB

LUBRICANT DRY FILM LUBRICANT SHALL BE IN ACCORDANCE WITH MIL-L-8937

PLATING CADMIUM PLATING SHALL BE IN ACCORDANCE WITH QQ-P-416, TYPE II, EXCEPT THE THICKNESS SHALL BE A MAXIMUM OF 0.00

ADD THE LETTER "L" AFTER THE PART NUMBER TO DESIGNATE A DRY FILM LUBRICANT COATED INSERT

ADD THE LETTER "P" AFTER THE PART NUMBER TO DESIGNATE A CADMIUM PLATED INSERT

THE MS PART NUMBER CONSISTS OF THE BASIC MS NUMBER PLUS THE DASH NUMBER

EXAMPLE OF PART NUMBER MS21209C0415 = A SCREW LOCKING HELICAL COIL INSERT (MS21209), COARSE THREAD (C), NUMBER 4 THREAD

DIAMETER (104), 1.5 DIA NOMINAL LENGTH (15)

MS21209F4-20L = A SCREW LOCKING HELICAL COIL INSERT (MS21209), FINE THREAD (F), 0.0250-28 THREAD

DIAMETER (4), WITH A DRY FILM LUBRICANT (L)

MS21209F1225P = A SCREW LOCKING HELICAL COIL INSERT (MS21209), FINE THREAD (F), 0.0750-16 THREAD

DIAMETER (12), 2.5 DIAMETER NOMINAL LENGTH (25), WITH CADMIUM PLATING (P)

THIS STANDARD TAKES PRECEDENCE OVER DOCUMENTS REFERENCED HEREIN

REFERENCED DOCUMENTS SHALL BE OF THE ISSUE IN EFFECT ON DATE OF INVITATIONS FOR BID

USAF - II	INTERNATIONAL INTEREST	TITLE	MILITARY STANDARD
Other Cost		INSERT, SCREW THREAD, COARSE AND FINE, SCREW LOCKING HELICAL COIL CRES	MS21209
Army - AV			
PROCUREMENT SPECIFICATION MIL- I - 8646	SUPERSEDES		SHEET 5 OF 5

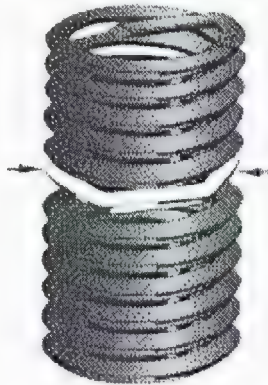
DD FORM 672-1

APPROVED 17 JUL 61 REVISED (E) 21 Feb 76

Army - AS, OS
Navy - AS, OS
Air Force -
DLA -User
ActivitiesArmy - MI, AR, EL
Navy - AS, OS
Air Force - 99
DLA - ISReview
ActivitiesThis military standard is approved for use by all Departments
and Agencies of the Department of Defense. Selection for all
new engineering and design applications and for repetitive use
shall be made from this document, when applicable

|HeliCoil® Screw Thread Inserts

| UNC Inserts (Screw-Lock) |



[Click Here For Ordering And Specifications](#)



Let the Fastener Wizard
help walk you through
the selection process

The HELI-COIL SCREW-LOCK INSERT provides an exclusive, resilient internal locking thread that grips the bolt and prevents it from loosening under vibration or impact.

Locking action is achieved by one or more of the coils of the Insert having a series of straight segments, or chords. When the bolt enters this grip coil these chordal segments flex outward creating pressure on the bolt. This pressure is exerted between the flanks of the bolt thread thus utilizing the maximum contact area and minimizing the unit pressure.

HELI -COIL SCREW-LOCK INSERTS permit repeated assembly and disassembly, yet will not relax their grip on the screw even in tough metals such as cast iron, alloy steel, titanium, etc.

Characteristics

- Screw-Lock Inserts positively secure threaded members against loosening caused by vibration and shock. They have a high reusable factor due to the exclusive HELI-COIL Resilient Screw-Lock which permits frequent removal and reassembly of bolt without appreciable, loss of torque.
- [• Positive self-locking torque, complying with MIL-I-8846 & MIL-N-25027.
- Savings in space, weight and money, through the elimination of lock wiring, lock nuts, lock washers, chemical compounds, plastic pellets/patches and other locking mechanisms.

In addition Screw-Lock Screw Thread Inserts have all the characteristics of Free Running Inserts.

Allied Tool.

CALGARY
FASTENER.

TRANSACTION RECORD 050107/09:51

RALPH'S ARCTIC CAT/YAMAH
#5 2220-32 AVE N E
CALGARY ALBERTA
T2E6T4

TERM ID: 02435457

MID: 487678

CARD # 4520848001678171

EXP: 06 06

ACCT TYPE: VISA

PURCHASE

REF NO: 0005077

AMOUNT \$7.83

(001) APPROVED - THANK YOU AUTH #047777

CARDHOLDER AGREES TO PAY ISSUER SUCH
TOTAL IN ACCORDANCE WITH ISSUER'S
AGREEMENT WITH CARDHOLDER

X

CARDHOLDER SIGNATURE

Ralph's Arctic Cat / Yamaha

#5, 2220-32 Avenue N.E
Calgary, Alberta T2E 6T4
403-291-4868

Invoice

Ticket Number: 17195

Salesperson: Tracy Hubers

Cashier: Tracy Hubers

Date: 01/07/2005

Sold To:

Aero Design
2013 39 Ave NE
Calgary, AB T2E 6R7
403-250-8027

Sold	S/O	Lay	P/U	PartNumber	Src	Cat	Description	Price	Sold Now Bin
1				0115-307	AC	PM1	Hood Latch	\$2.48	\$2.482A15
1				0115-306	AC	PM1	Latch Cord	\$4.84	\$4.843F7

Sub-Total	\$7.32
Taxable Subtotal	\$7.32
GST Tax	\$0.51
PST Tax	\$0.00
Invoice Total	\$7.83
Total Amount Due	\$7.83
Visa	\$7.83

Business Number: 89797 1685

Thank You For Your Business!

NO RETURNS ON ELECTRICAL PARTS!

www.ralphsmotorsports.com

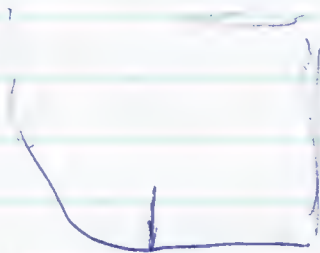
Measurement taken
E & B is 407
Low Basket
Fitted Attachment

707 Basket

AL HANSEN

250-738-0333

Qualicum Beach.

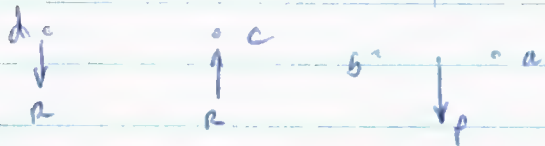


2 1/4

Bottom of Door.
Top surface of
Basket Lid.

Machined Beams

20.5 17.25 11



~~11.25~~

$P = 171 \text{ lb} \rightarrow \frac{1}{2} \text{ basket, } \frac{2}{3} \text{ cargo beam}$
 $P = 171 \times 5.25 = 897.75 \rightarrow 900$

$M_c = \text{Not Known} 29137 \text{ in lb}$ Report CR492.01
 $= 29137$

$F_b = \frac{M_y}{I}$
 $= \frac{29137}{1.312} \times 1.5$

@C $\frac{I_x}{I_y} = 1.312 \text{ in}^4$
 $I_y = 0.084 \text{ in}^4$
 $v = 1.5$

$F_b = 38 \text{ ksi}$
 38.3

$F_{tu} = 38 \text{ ksi}$ MS = ~~38~~ = ~~UNB~~

MS = $\frac{38}{33.3} - 1 = 0.14$

MS is positive

Drag

$M_{max} = 3894 \text{ in lb}$ @ C + b
 CC tension

$F_b = \frac{M_y}{I} = \frac{3894 \times 0.708}{0.084}$
 $= 32.8 \text{ ksi}$

Comp.
 $= \frac{3894 \times 0.292}{0.084}$
 $= 13.5 \text{ ksi}$

~~11.25~~

MULTI

0115-307

LATCH CUP, HOOD



CUST:01

80200463

141000

10-4

3CH-015-02

5

SKU: 361 of 693

PART NUMBER:

0115-307

PACKAGE QTY: 5

DESCRIPTION:

LATCH CUP, HOOD

MADE IN: USA



DATE: 5/4/01

CONTACT YOUR LOCAL
ARCTIC CAT DEALER
FOR ADDITIONAL PARTS

PACKING SLIP

10 April, 2006

Address:

Kananaskis Mountain Helicopters
C/O Vancouver Island Helicopters
Box 368 4275 Hangar Road
Prince George, BC
V2L 4S2

Attention:

Reference: Your Purchase Order: 301

Quantity Ordered	Quantity Shipped	Description	Part Number
1	1 ✓	Cargo Basket Assembly (S/N 49201-28)	60630-01
1	1 ✓	Forward Support Beam	49221-01
1	1 ✓	Aft Support Beam	49221-02
4	4 ✓	Mounting Plate	60646-01
2	2 ✓	Forward External Attachment Fitting	60621-01
2	2 ✓	Barrel Nut	49320-01
2	2 ✓	Block	60620-01
2	2 ✓	Barrel Nut	60622-01
2	2 ✓	Barrel Nut	60624-01
2	2 ✓	Bushing	60647-01
4	5 ✓	Bolt	AN3-15A
8	12 ✓	Washer	AN960-10
4	4 ✓	Nut	MS21044N3
4	4 ✓	Bolt	AN4-16A
8	12 ✓	Washer	AN960-416
4	4 ✓	Nut	MS21044N4
4	4 ✓	Bolt	AN6-17A
4	8 ✓	Washer	AN960-616
2	2 ✓	Bolt	NAS6206-11
1	1 ✓	Supplemental Type Certificate	SH00-48
1	1 ✓	Document Control List	DCL606-1
1	1 ✓	Flight Manual Supplement	FMS606.01
1	1 ✓	Installation Drawing – Cargo Basket	60603
1	1 ✓	Installation Drawing – Attachment Provisions	60602
1	1 ✓	Maintenance Instructions	MI 606.01

Ted:

Jean Johnson

- flight permit?

(604) 273-5311

50
12
600
1800
850
950
400
EMTY - 3175
gross 5000

E. Burgoin

From: "Ron Cashin, Purchasing Manager" <rcashin@uhn1.nf.ca>
To: "E. Burgoin" <ted@aerodesign.ca>
Sent: Tuesday, February 28, 2006 8:52 AM
Subject: Re: Bell 206L-3 Cargo Baskets

Ted

It will be: Dave Maloley
Ph: 613-990-8664

Thanks again
Ron

----- Original Message -----

From: E. Burgoin
To: rcashin@uhn1.nf.ca
Sent: Tuesday, February 28, 2006 11:52 AM
Subject: Bell 206L-3 Cargo Baskets

Ron:

Do you have a name and a phone number at Natural Resources in Ottawa that can be put on the shipping label?

Ted.

04/06/2006 16:08 FAX 403+844+4499

ICEFIELD HELI TOURS

001

**Kananaskis Mountain
Helicopters**

RR2, Site 7, Box 2
Rocky Mountain House, Alberta T4T 2A2
Tel: 403-844-4443
Fax: 403-844-4499

PURCHASE ORDER

Nº 0301

TO: *AERO DESIGN*
Fax: 403 250 8333

P.O. NUMBER
DATE
REQUISITIONED BY
SHIP BY
SHIP VIA
F.O.B.
TERMS

#0301
6 April 06
Kan HL
CANADIAN FREIGHTWAYS

SHIP TO:
VANCOUVER ISLAND HELICOPTERS
Box 368, 4275 HANGAR ROAD
PRINCE GEORGE, B.C V2L-4S2

VIHACT # 91-0006177

Purchase order number must appear
on all forms relating to this order.

250-963-9884

QTY	UNIT	DESCRIPTION	PRICE	AMOUNT
<i>1</i>		<i>407 EXTENDED LENGTH SKI BASKET W/SAFETY LATCH</i>		

SUBTOTAL 0.00
FREIGHT 0.00
TAX RATE 7.000%
TAX 0.00

TOTAL DUE

Authorized by

Date

S. Shiger

6 April 06

CONSIGNEE RECEIPT

COLLECT

EXPRESS RECEIPT
(NON-NEGOTIABLE)



GREYHOUND COURIER EXPRESS

Greyhound Canada Transportation Corp.

GST: 89164 6655 RT0001



4104

CONSIGNEE ACCOUNT NO

SPECIAL SERVICES

IN CITY

AM PM

SPECIAL HANDLING

RESIDENTIAL
PICK UP

RESIDENTIAL
DELIVERY

OVERSIZE

DELIVERY OPTIONS

STATION TO

DOOR TO
DOOR

STATION TO
CH

PACKAGING

EXPRESS \$

19 69

DESTINATION STATION - CITY

PROV

13386043720

CONSIGNEE

CONSIGNEE PHONE NO FROM ZONE TO

STREET ADDRESS

POSTAL CODE

CUSTOMER

DRIVER

PICKUP DELIVERY AGENT

NO PCS TARE ACTUAL WT

DATE SHIPPED

TIME

AM

PM

CONSIGNEE ACCOUNT NO

0281741

SHIPPER'S NAME

CANAM AEROSPACE INC

STREET ADDRESS

19158 94 AVE UNIT 1

ORIGIN - CITY

PROV.

POSTAL CODE

SURREY

BC VAN 4XB 604-888-7934 X

LIABILITY FOR LOSS DAMAGE OR DELAY IS LIMITED BY CARRIER.
REFER TO BACK OF SHIPPER RECEIPT FOR DETAILS OR CONSULT
AGENT

SHIPPER'S NAME ESPECIALLY HEREON ARE TO BE CHECKED
AND THAT ANY CONTAINING DANGEROUS GOODS IS PROPERLY
DESCRIBED BY NAME AND IS IN PROPER CONDITION FOR
SHIPMENT IN ACCORDANCE WITH DANGEROUS GOODS
REGULATIONS

TELEPHONE NO

SHIPPER'S SIGNATURE

GST

TOTAL COLLECT

\$ 2207

Jeff Clarke

Flse

94

1.44

DATE

**OVERLAND FREIGHT LINES LTD.**

151 SPRUCE STREET, NEW WESTMINSTER, B.C. V3L 5E6

MONTH

DAY

YEAR

SEE REVERSE FOR TELEPHONE NUMBERS AND ADDITIONAL INFORMATION

PREPAID☐ CHARGE SHIPPER**COLLECT**☐ CHARGE CONSIGNEE**FROM**

SHIPPER'S NO.

POSTAL CODE

TO

CONSIGNEE'S ORDER NO.

POSTAL CODE

SHIPPER'S
C.O.D.OVERLAND
B/L NUMBERCASH OR CERTIFIED
CHEQUE ONLYC.O.D.
FEEC.O.D.
AMOUNT

MAXIMUM LIABILITY FOR LOSS, DAMAGE OR DELIVERY DELAY OF
GOODS IS ALWAYS LIMITED TO \$2.00 PER POUND OF ACTUAL PRODUCT
LOSS OR DAMAGE UNLESS A HIGHER VALUE IS DECLARED AND
ADDITIONAL INSURANCE PREMIUMS PAID. (SEE REVERSE)

ADVANCE

INTERLINE CARRIER

INTERLINE PRO NO.

**ADVANCE
INTERLINE CHGS.**SEE REVERSE FOR
LIMITATIONS OF LIABILITY

BEYOND INTERLINE CARRIER

INTERLINE PRO NO.

IF PREPAID
BEYOND
INTERLINE CHGS.

SHIPPER'S

SIGNATURE **X**

DECLARED VALUE

IF COLLECT BEYOND INTERLINE CARRIER
PROTECT OUR ADVANCE CHARGE.NO.
PIECESDESCRIPTION
SPECIFY DIMENSIONS OF SHIPMENT

WEIGHT

RATE

TOTAL PIECESCHARGE TO (IF OTHER
THAN ABOVE)AUTHORIZED BY:
PLEASE PRINT

GST

RECEIVED IN APPARENT GOOD ORDER

PLEASE PRINT

NAME

SIGNATURE

X

TIME

DATE

TIME

DATE

TOTAL

PICKUP DRIVER

TRUCK #

DELIVERY DRIVER

TRUCK #

MAXIMUM LIABILITY FOR LOSS, DAMAGE OR DELIVERY DELAY OF
GOODS IS ALWAYS LIMITED TO \$2.00 PER POUND OF ACTUAL PRODUCT
LOSS OR DAMAGE UNLESS A HIGHER VALUE IS DECLARED ABOVE AND
ADDITIONAL INSURANCE PREMIUMS PAID. (SEE REVERSE)

OVERLAND

PIECES

Terms and conditions of carriage
of this shipment are as stated
on Overland's Standard Bill of
Lading

6783922-5

CONSIGNEE

CONSIGNEE

**VANCOUVER
DISPATCH****(604) 520-9455****CONSIGNEE**

NOTE: Articles will not be accepted for shipment unless properly packaged and addressed. (This Bill of Lading is to be signed by the shipper and carrier issuing same.)
THE AGREED VALUATION ON HOUSEHOLD GOODS, PERSONAL EFFECTS, USED PARTS, AND USED EQUIPMENT IS NOT EXCEEDING \$.30 PER LB PER ARTICLE
UNLESS OTHERWISE SPECIFIED. OVERDUE AMOUNT SUBJECT TO INTEREST CHARGE OF 2% PER MONTH.

SEE REVERSE FOR TERMS AND CONDITIONS OF CARRIAGE, INCLUDING LOSS, DELAY AND LIMITATIONS OF LIABILITY.

GST #R104031315

DATE


OVERLAND CA **FREIGHT COURIER**

BILL OF LADING NO.

6945894-4

MONTH

DAY

YEAR

SEE REVERSE FOR TELEPHONE NUMBERS AND ADDITIONAL INFORMATION

CUSTOMER
CODE**PREPAID**☐ CHARGE SHIPPER**COLLECT**☐ CHARGE CONSIGNEE

FROM

SHIPPER'S NO.

POSTAL CODE

TO

CONSIGNEE'S ORDER NO.

POSTAL CODE

SHIPPER'S
C.O.D.

SHIPPER

CONSIGNEE

CASH OR CERTIFIED
CHEQUE ONLYC.O.D.
FEEC.O.D.
AMOUNT

MAXIMUM LIABILITY FOR LOSS, DAMAGE OR DELIVERY DELAY OF GOODS IS ALWAYS LIMITED TO \$2.00 PER POUND OF ACTUAL PRODUCT LOSS OR DAMAGE UNLESS A HIGHER VALUE IS DECLARED ABOVE AND ADDITIONAL INSURANCE PREMIUMS PAID. (SEE REVERSE)

INTERLINE CARRIER

INTERLINE PRO NO.

INTERLINE CHGS.

SHIPPER'S
SIGNATURE

DECLARED VALUE

IF COLLECT BEYOND INTERLINE CARRIER
PROTECT OUR ADVANCE CHARGE.NO.
PIECESDESCRIPTION
SPECIFY DIMENSIONS OF SHIPMENT

WEIGHT

THIS PORTION LOCAL COURIER USE ONLY:P ☐ EXPRESS ☐ SAME DAY ☐ 24 HOUR ☐PLEASE CALL YOUR LOCAL TERMINAL
FOR DEFINITION OF SERVICE LEVELS AND TIME FRAMESOTHER TO (IF OTHER
THAN ABOVE)AUTHORIZED BY:
PLEASE PRINT

GST

RECEIVED IN APPARENT GOOD ORDER

TIME

DATE

TIME

DATE

TOTALPLEASE PRINT
NAME

PICKUP DRIVER

TRUCK #

DELIVERY DRIVER

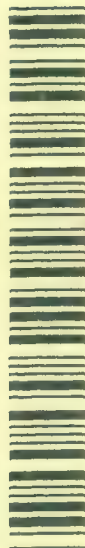
TRUCK #

SIGNATURE

MAXIMUM LIABILITY FOR LOSS, DAMAGE OR DELIVERY DELAY OF GOODS IS ALWAYS LIMITED TO \$2.00 PER POUND OF ACTUAL PRODUCT LOSS OR DAMAGE UNLESS A HIGHER VALUE IS DECLARED ABOVE AND ADDITIONAL INSURANCE PREMIUMS PAID. (SEE REVERSE)

NOTE: Articles will not be accepted for shipment unless properly packaged and addressed (This Bill of Lading is to be signed by the shipper and carrier issuing same).
THE AGREED VALUATION ON HOUSEHOLD GOODS, PERSONAL EFFECTS, USED PARTS, AND USED EQUIPMENT IS NOT EXCEEDING \$.30 PER LB. PER ARTICLE
UNLESS OTHERWISE SPECIFIED. OVERDUE AMOUNT SUBJECT TO INTEREST CHARGE OF 2% PER MONTH.
SEE REVERSE FOR TERMS AND CONDITIONS OF CARRIAGE, INCLUDING LOSS, DELAY AND LIMITATIONS OF LIABILITY.

GST #R104031315



6945894

- SHIPPER -

MONTH 08 DAY 01 YEAR



BILL OF LADING NO.

7077338-2

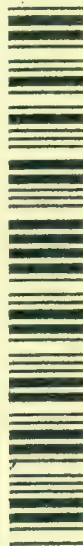
SEE REVERSE FOR TELEPHONE NUMBERS AND ADDITIONAL INFORMATION

**CUSTOMER
CODE**

<input checked="" type="checkbox"/> PAID <input type="checkbox"/> CHARGE SHIPPER		<input type="checkbox"/> COLLECT <input type="checkbox"/> CHARGE CONSIGNEE	
FROM		SHIPPER'S NO.	POSTAL CODE
TO		CONSIGNEE'S ORDER NO.	POSTAL CODE
SHIPPER'S C.Q.D.		SHIPPER'S C.Q.D.	
SHIPPER'S CASH OR CERTIFIED CHEQUE ONLY		SHIPPER'S CASH OR CERTIFIED CHEQUE ONLY	
SHIPPER'S C.O.D. FEE		SHIPPER'S C.O.D. FEE	
SHIPPER'S C.O.D. AMOUNT		SHIPPER'S C.O.D. AMOUNT	
MAXIMUM LIABILITY FOR LOSS, DAMAGE OR DELIVERY DELAY OF GOODS		MAXIMUM LIABILITY FOR LOSS, DAMAGE OR DELIVERY DELAY OF GOODS	
INTERLINE CARRIER		INTERLINE PRO NO.	
INTERLINE CHGS.		INTERLINE CHGS.	
SHIPPER'S SIGNATURE		DECLARED VALUE	IF COLLECT BEYOND INTERLINE CARRIER PROTECT OUR ADVANCE CHARGE.
NO. PIECES	DESCRIPTION	WEIGHT	
SPECIFY DIMENSIONS OF SHIPMENT			
TOTAL PIECES			
THIS PORTION LOCAL COURIER USE ONLY:		PLEASE CALL YOUR LOCAL TERMINAL FOR DEFINITION OF SERVICE LEVELS AND TIME FRAMES	
PANIC <input type="checkbox"/> EXPRESS <input type="checkbox"/> SAME DAY <input type="checkbox"/> 24 HOUR <input type="checkbox"/>			
CHARGE TO (IF OTHER THAN ABOVE)		AUTHORIZED BY: PLEASE PRINT	GST
RECEIVED IN APPARENT GOOD ORDER		TIME	DATE
PLEASE PRINT NAME		TIME	DATE
SIGNATURE		PICKUP DRIVER	TRUCK #
		DELIVERY DRIVER	TRUCK #
		TOTAL	
		MAXIMUM LIABILITY FOR LOSS, DAMAGE OR DELIVERY DELAY OF GOODS IS ALWAYS LIMITED TO \$2.00 PER POUND OF NET LOSS OR DAMAGE UNLESS A HIGHER VALUE IS DECLARED. ADDITIONAL INSURANCE PREMIUMS PAID.	

NOTE: Articles will not be accepted for shipment unless properly packaged and addressed. (This Bill of Lading is to be signed by the shipper and carrier, showing same.)
THE AGREED VALUATION ON HOUSEHOLD GOODS, PERSONAL EFFECTS, USED PARTS, AND USED EQUIPMENT IS NOT EXCEEDING \$30 PER LB. PER ARTICLE.
UNLESS OTHERWISE SPECIFIED, OVERDUE AMOUNT SUBJECT TO INTEREST CHARGE OF 2% PER MONTH.
SEE REVERSE FOR TERMS AND CONDITIONS OF CARRIAGE, INCLUDING LOSS, DELAY AND LIMITATIONS OF LIABILITY. GST #R1040313

GST #R104031315



7077338

Details

SHIPPER'S NAME AND ADDRESS AERO DESIGN LTD. 2013 39TH AVE NE CALGARY AB T2E 6R7		SHIPPER'S ACCOUNT NUMBER		NOT NEGOTIABLE AIR WAYBILL (AIR CONSIGNMENT NOTE)		AIR NORTH LTD. 150 CONDOR ROAD WHITEHORSE, YT Y1A 6E6 GST NO. R100094499 Copies 1, 2 and 3 of this Air Waybill are originals and have the same validity.	
CONSIGNEE'S NAME AND ADDRESS DISCOVERY HELICOPTERS Box 178 ATLIN BC V0W 1A0		CONSIGNEE'S ACCOUNT NUMBER		It is agreed that the goods described herein are accepted in apparent good order and condition (except as noted) for carriage SUBJECT TO THE CONDITIONS OF CONTRACT ON THE REVERSE HEREOF. THE SHIPPER'S ATTENTION IS DRAWN OF THE NOTICE CONCERNING CARRIERS' LIMITATION OF LIABILITY. Shipper may increase such limitation of liability by declaring a higher value for carriage and paying a supplemental charge if required.			
ISSUING CARRIERS AGENT NAME AND CITY				TO EXPEDITE MOVEMENT, SHIPMENT MAY BE DIVERTED TO MOTOR OR OTHER CARRIER AS PER TARIFF RULE UNLESS SHIPPER GIVES OTHER INSTRUCTIONS HEREON. ALSO NOTIFY NAME AND ADDRESS (OPTIONAL ACCOUNTING INFORMATION)			
AGENTS IATA CODE		ACCOUNT NO.		ACCOUNTING INFORMATION			
AIRPORT OF DEPARTURE (ADDR OF FIRST CARRIER) AND REQUESTED ROUTING							
ROUTING AND DESTINATION				CURRENCY			
TO		BY FIRST CARRIER		TO		BY	
AIRPORT OF DESTINATION		FOR CARRIER USE ONLY		AMOUNT OF INSURANCE		INSURANCE	
		FLIGHT/DATE		FLIGHT/DATE		If shipper requests insurance in accordance with conditions on reverse hereof, indicate amount to be insured in figures in box marked amount of insurance.	
HANDLING INFORMATION				These commodities licensed by IUS for ultimate destination Diversion contrary to US law is provided			

HOLD FOR PICK UP @ WHITEHORSE
HEATHER (250) 651-7569

[illegible]

PREPAID		WEIGHT CHARGE		COLLECT		P-UP ZONE		PICKUP CHARGES		ORIGIN ADVANCE CHARGES		DESCRIPTION OF ORIGIN ADVANCE		ITEMS PREPAID	
A.		VALUATION CHARGE				DEL. ZONE		DELIVERY CHARGES		DEST. ADVANCE CHARGES		DESCRIPTION OF DEST. ADVANCE		ITEMS COLLECT	
D.		TAX				SHIPPER'S R.F.C. (AMOUNT TO BE ENTERED BY SHIPPER)				OTHER CHARGES AND DESCRIPTION					
I.		TOTAL OTHER CHARGES DUE AGENT				J.				F.					
		TOTAL OTHER CHARGES DUE CARRIER													
G.		COD 		CURRENCY								SIGNATURE OF SHIPPER OR HIS AGENT			

TOTAL PREPAID	TOTAL COLLECT	EXECUTED ON	
		Jan 23 / 12:30 PM '90	Sylvia
CURRENCY CONVERSION RATES	TOTAL COLLECT IN DESTINATION CURRENCY	(Date) (Time) at (Place)	SIGNATURE OF ISSUING CARRIER OR ITS A
FOR CARRIERS USE ONLY AT DESTINATION	CHARGES AT DESTINATION	TOTAL COLLECT CHARGES	NO. 3 ORIG. FOR SHIPPER 287 0193979 2
(ALL COLLECT CHARGES IN DESTINATION CURRENCY)			

NO. 3
ORIG. FOR SHIPPER 287 0193979 2

U.S. DOMESTIC CONDITIONS OF CONTRACT

- In tendering the shipment described herein for carriage, shipper agrees to these Conditions of Contract, which no agent or employee of the parties may alter, and that this airbill is non-negotiable and has been prepared by him, or on his behalf, by the carrier.
- It is mutually agreed that the shipment described herein is accepted on the date hereof in apparent good order (except as noted) for carriage as specified herein, subject to governing classifications and tariffs in effect as of the date hereof which are filed in accordance with law. Said classifications and tariffs are available for inspection by the parties hereto and incorporated into and made part of this contract.
- Carrier(s) liability is agreed and understood to be \$50. per pound, multiplied by the number of pounds (or fraction thereof) of each piece(s) of the shipment which may have been delayed, lost, damaged, or destroyed, (but not less than \$50.00 per shipment), unless a higher value is declared herein and applicable charges paid thereon for the actual value of such piece(s), whichever is less, plus the amount of any transportation charges for which the carrier may be liable, or the amount of any damages actually sustained, whichever is the least amount. However, certain commodities may be deemed to have a lesser value, in which case the value, as stated in the governing tariffs, will apply.
- Carrier(s) liability is agreed and understood to be \$50. per pound, multiplied by the number of pounds (or fraction thereof) of each piece(s) of the shipment which may have been delayed, lost, damaged, or destroyed (but not less than \$50.00 per shipment), unless a higher value is declared herein and applicable charges are paid, carrier liability is agreed and understood to be in no event exceed:

- \$50. per pound, multiplied by the number of pounds (or fraction thereof) of each piece(s) of the shipment which may have been delayed, lost, damaged, or destroyed (but not less than \$50.00 per shipment); plus the amount of any transportation charges for which the carrier may be liable, or

- The amount of any charges actually sustained, whichever is the least amount.
- Shipper must enter the amount of any shipper's C.O.D., which shall be collected subject to the fee and rules of the delivering carrier.
- Carrier's routing applies unless shipper inserts specific routing.
- Delivery will be made by the delivering carrier to the consignee at a point where delivery service is available at applicable tariff charges unless instructions to deliver at city terminal or airport terminal are specified by the shipper under "Special Instructions".
- Shipment is subject to charges for actual or dimensional weight in accordance with applicable tariff rules.
- International air carriage (as defined in air carrier's tariff) is subject to rules relating to liability established by the Convention for the Unification of certain rules relating to international carriage by air, signed at Warsaw, October 12, 1929. Agreed stopping places (other than the origin of destination airports) shown under ORIGIN and ROUTING and/or those places shown in air carrier's timetable as scheduled stopping places for its route. For the purpose of such Convention, this document is an air waybill, comprising three original parts for the consignor, carrier and consignee, respectively which is executed by or on behalf of the first air carrier named under ROUTING and whose address is the airport of departure shown under ORIGIN unless otherwise specified herein. Carrier's name or address, or both, may be abbreviated in accordance with abbreviations explained in carrier's tariffs or timetable.
- To expedite movement, shipment may be diverted to motor or other carrier, as per tariff rule, unless shipper gives other instructions hereon.

*A carrier may, at its option, use either of the conditions in #3.

CHARGE CODES: (See Charges box at top of Airbill)

CC - Collect
CG - COLLECT G.B.L.
CP - COLLECT CASH
CX - COLLECT CREDIT
MC - PART PREPAID CREDIT,
PART COLLECT CASH
MS - PART PREPAID CASH,
PART COLLECT CREDIT
MX - PART PREPAID PARTIAL
COLLECT - CREDIT
MP - PART PREPAID, PARTIAL
COLLECT - CASH
PG - PREPAID GBL AND/OR GTR
PX - PREPAID CREDIT
PP - PREPAID CASH

EXPLANATION OF CODES

OTHER CHARGE CODES (See box for Description of Other Charges)

A - ASSEMBLY
B - CLEARANCE HANDLING
C - CONTAINER/KENNEL
D - DISTRIBUTION
E - INSURANCE
F - MISCELLANEOUS
DUE FINAL CARRIER
G - SIGNATURE SERVICE
H - SEPARATE EARLY RELEASE
M - MISC-DUE ORIGIN CARRIER
P - PACKAGING
S - STORAGE
T - STATE SALES TAX
X - UNASSIGNED
RFC - REMITTANCE FOLLOWING
COLLECTION

For Rate Base Codes

Consult Appropriate

Tariff

PICK-UP and/or DELIVERY ZONE CODES

FIRST LETTER - A. Pick Up and Delivery Area Zone Code

Example -

Los Angeles - Area A of Airport City of Los Angeles
Pasadena - Area B of Airport City of Los Angeles
Santa Ana - Area C of Airport City of Los Angeles

SECOND LETTER - Type of Service rendered.

Regular Pick-up and/or Delivery Service.

Repeat the Area Zone Code of the First Letter

Example - Los Angeles - AA

Other Second Letter Codes

SS - Special Pick-up and/or Delivery

H - Sunday and Holiday Pick-up and/or Delivery Service

T - City Terminal Pick-up and/or Delivery Service

XX - Shipment received at Airport (No Pick-up)

XX - Shipment held at Airport (no Delivery)

INTERNATIONAL CONDITIONS OF CONTRACT. NOTICE CONCERNING CARRIERS' LIMITATION OF LIABILITY

IF THE CARRIAGE INVOLVES AN ULTIMATE DESTINATION OF STOP IN A COUNTRY OTHER THAN THE COUNTRY OF DEPARTURE, THE WARSAW CONVENTION MAY BE APPLICABLE AND THE CONVENTION GOVERNS AND IN MOST CASES LIMITS THE LIABILITY OF THE CARRIER IN THE EVENT OF LOSS, DAMAGE OR DELAY TO CARGO TO 250 FRENCH GOLD FRANCS PER KILOGRAMME, UNLESS A HIGHER VALUE IS DECLARED IN ADVANCE BY THE SHIPPER AND A SUPPLEMENTARY CHARGE PAID IF REQUIRED.

THE LIABILITY LIMIT OF 250 FRENCH GOLD FRANCS PER KILOGRAMME IS APPROXIMATELY US \$42.22 PER OUNCE OF GOLD.

CONDITIONS OF CONTRACT

- As used in this contract "Carrier" means all air carriers that carry or undertake to carry the goods hereunder or perform any other services incidental to such air carriage. "Warsaw Convention" means the Convention for the Unification of certain Rules relating to International Carriage by Air, signed at Warsaw, 12 October 1929, or that Convention as amended at The Hague, 28 September 1955, whichever may be applicable, and "French gold francs" means francs consisting of 65½ milligrams of gold with a fineness of nine hundred thousandths.
- (a) Carriage hereunder is subject to the rules relating to liability established by the Warsaw Convention unless such carriage is not "international carriage" as defined by that Convention;
- (b) to the extent not in conflict with the foregoing, carriage hereunder and other services performed by each Carrier are subject to:
 - applicable laws (including national laws implementing the Convention), government regulations, orders and requirements,
 - provisions herein set forth, and
 - applicable tariffs, rules, conditions of carriage, regulations and timetables (but not the times of departure and arrival therein) of such carrier, which are made part hereof and which may be inspected at any of its offices and at airports from which it operates regular services. In transportation between a place in the United States or Canada and any place outside thereof the applicable tariffs are the tariffs in force in those countries.

The first Carrier's name may be abbreviated on the face hereof, the full name and its abbreviation being set forth in such Carrier's tariffs, conditions of carriage, regulations and timetables. The first Carrier's address is the airport of departure shown on the face hereof. The agreed stopping places (which may be altered by Carrier in case of necessity) are those places, except the place of departure and the place of destination, set forth on the face hereof or shown in Carrier's timetables as scheduled stopping places for the route. Carriage to be performed hereunder by several successive carriers is regarded as a single operation.

- Except as otherwise provided in Carrier's tariffs or conditions of carriage, in carriage to which the Warsaw Convention does not apply Carrier's liability shall not exceed US \$20.00 or the equivalent per kilogramme of goods lost, damaged or delayed, unless a higher value is declared by the shipper and a supplementary charge paid.
- If the sum entered on the face of the Air Waybill as "Declared Value for Carriage" represents an amount in excess of the applicable limits of liability referred to in the above Notice and in these Conditions, and if the shipper has paid any supplementary charge that may be required by the Carrier's tariffs, conditions of carriage or regulations, this shall constitute a special declaration of value and in this case Carrier's limit of liability shall be the sum so declared. Payment of claims shall be subject to proof of actual damages suffered.
- In cases of loss, damage or delay of part of the consignment, the weight to be taken into account in determining Carrier's limit of liability shall be only the weight of the package or packages concerned.

Note:

Notwithstanding any other provision, for foreign air transportation as defined in the U.S. Federal Aviation Act, as amended, in case of loss or damage or delay of a shipment or part thereof, the weight to be used in determining the carrier's limit of liability shall be the weight which is used (or a pro rata share in the case of a part shipment loss, damage or delay) to determine the transportation charge for such shipment.

- Any exclusion or limitation of liability applicable to Carrier shall apply to and be for the benefit of Carrier's agents, servants and representatives and any person whose aircraft is used by Carrier for carriage and its agents, servants and representatives. For purposes of this provision Carrier acts herein as agent for all such persons.
- (a) Carrier undertakes to complete the carriage hereunder with reasonable dispatch. Carrier may substitute alternate carriers or aircraft and may without notice and with due regard to the interests

of the shipper substitute other means of transportation. Carrier is authorized to select the routing or to change or deviate from the routing shown on the face hereof. This Subparagraph is not applicable to/from USA;

- Carrier undertakes to complete the carriage hereunder with reasonable dispatch. Except within USA where carrier tariffs will apply, Carrier may substitute alternate carriers or aircraft and may without notice and with due regard to the interests of the shipper substitute other means of transportation. Carrier is authorized to select the routing or to change or deviate from the routing shown on the face hereof. This Subparagraph is applicable only to/from USA.
- Subject to the conditions herein, the Carrier shall be liable for the goods during the period they are in its charge or the charge of its agent.
- Except when the Carrier has extended credit to the consignee without the written consent of the shipper, the shipper guarantees payment of all charges for carriage due in accordance with Carrier's tariffs, conditions of carriage and related regulations, applicable laws (including national laws implementing the Convention), government regulations, orders and requirements;
- when no part of the consignment is delivered, a claim with respect to such consignment will be entertained even though transportation charges thereon are unpaid.
- Notice of arrival of goods will be given promptly to the consignee or to the person indicated on the face hereof as the person to be notified. On arrival of the goods at the place of destination, subject to the acceptance of other instructions from the consignor prior to arrival of the goods at the place of destination, the consignee declines to receive the goods or the consignee declines to receive the goods with instruction.
- The person entitled to delivery must make a complaint to the Carrier in writing in the case
 - of visible damage to the goods, immediately after discovery of the damage and at the latest within 14 days from receipt of the goods.
 - of other damage to the goods, within 14 days from the date of receipt of the goods,
 - of delay, within 21 days of the date the goods are placed at his disposal, and
 - of non-delivery of the goods, within 120 days from the date of the issue of the Air Waybill;
- for the purpose of Subparagraph (a) above complaint in writing may be made to the Carrier whose Air Waybill was used, or to the first Carrier or to the last Carrier or to the Carrier who performed the transportation during which the loss, damage or delay took place;
- any rights to damages against Carrier shall be extinguished unless an action is brought within two years from the date of arrival at the destination, or from the date on which the aircraft ought to have arrived, or from the date on which the transportation stopped.
- The shipper shall comply with all applicable laws, and government regulations of any country to, from, through or over which the goods may be carried, including those relating to the packing, carriage or delivery of the goods, and shall furnish such information and attach such documents to this Air Waybill as may be necessary to comply with such laws and regulations. Carrier is not liable to the shipper for loss or expense due to the shipper's failure to comply with this provision.
- No agent, servant or representative of Carrier has authority to alter, modify or waive any provisions of this contract.
- On request and if the appropriate premium is paid and the fact recorded on the face hereof, the goods covered by this Air Waybill are insured under an open policy for the amount requested as set out on the face hereof (recovery being limited to the actual value of goods lost or damaged provided that such amount does not exceed the insured value). The insurance is subject to the terms, conditions and coverage (from which certain risks are excluded) of the open policy, which is available for inspection at an office of the issuing Carrier by the interested party. Claims under such policy must be reported immediately to an office of Carrier.

1.79L-159

Aero Design

From: "Staal, Jack" <STAALJ@tc.gc.ca>
To: "Aero Design" <aerodesign@telusplanet.net>
Sent: April 12, 2005 1:18 PM
Attach: draft_stc2a.pdf
Subject: RE: C-05-0194, Bell 407/ 206L series Cargo Basket - SH00-48

Hi Jeff,

1)Thanks for the Draft. Comments on draft are as follows...with are according to my records,

- a)DCL606, Rev 1 is dated 20 July 2004.
- b)MI606.01 is at Revision 2 and dated 19 July 2004.
- c)DCL606 Revision 1 is dated 20 July 2004.
- d)MI606.01, is at Revision 2 dated 19 July 2004.
- e)DCL493 Revision 5 is dated 20 July 2004.
- f)FMS 493.01 is at Rev 0 dated 19 May 2002.
- g)MI493.01 is at Rev 2, dated 19 July 2004.
- h)DCL492 Rev 4 is dated 20 July 2004
- i)MI492.01 is Rev 3 dated 19 July 2004.
- j)DCL623, Rev 0 is dated 13 Jan 2005.

Could you quickly check these and confirm above as correct as they conflict with your draft. Correct your records as needed.

DCL606-1 Rev 0, 01 Feb 2005 refers to drawing 49218 at revision 0, I have this drawing at revision 1. DCL 606 also refers to this drawing at revision 1. Could you send a corrected version of the DCL606-1 and correct your records as needed.

Thanks

Regards,

J.H. (Jack) Staal

Aircraft Certification Technologist | Technologue, Certification des aeronefs.
 Prairie and Northern Region | Region des Prairies et du Nord

Telephone | telephone: (780)495-5227
 Facsimilie | telecopier: (780)495-7963
 Email | courriel: staalj@tc.gc.ca
 TTY / ATS : 1-888-675-6863

Transport Canada | Transports Canada
 1100- 9700, Jasper Avenue | avenue Jasper (RAED)
 Edmonton, AB T5J 4E6
 Government of Canada | Gouvernement du Canada

-----Original Message-----

From: Aero Design [<mailto:aerodesign@telusplanet.net>]
 Sent: Monday, April 11, 2005 4:20 PM
 To: Staal, Jack

Subject: Re: C-05-0194, Bell 407/ 206L series Cargo Basket - SH00-48

Jack,

Please find attached the requested draft STC.

Jeff Clarke
Technologist

AERO Design Ltd.

----- Original Message -----

From: "Staal, Jack" <STAALJ@tc.gc.ca>

To: "Steve Fahey (E-mail)" <steve.aerodesign@telusplanet.net>

Sent: Monday, April 11, 2005 2:19 PM

Subject: C-05-0194, Bell 407/ 206L series Cargo Basket - SH00-48

Hi Steve,

Could you give me draft STC for this project. Thanks.

J.H. (Jack) Staal

Aircraft Certification Technologist | Technologue, Certification des
aeronefs.

Prairie and Northern Region | Region des Prairies et du Nord

Telephone | telephone: (780)495-5227

Facsimilie | telecopier: (780)495-7963

Email | courriel: staalj@tc.gc.ca

TTY / ATS : 1-888-675-6863

Transport Canada | Transports Canada

1100- 9700, Jasper Avenue | avenue Jasper (RAED)

Edmonton, AB T5J 4E6

Government of Canada | Gouvernement du Canada

12/04/2005



Department of Transport

Supplemental Type Certificate

This approval issued to:

AERO Design Ltd.
2013 - 39th Avenue NE
Calgary, Alberta
T2E 6R7

Approval Number: SH00-48

Issue Number.: 4

Date of Approval: 8 December, 2000

Date of Issue: 2 February, 2005

Responsible Office: Prairie and Northern

Aircraft / Engine Type: Bell

Model: 206L, L-1, L-3, L-4
407

Registration: All Eligible

Serial No.: All Eligible

Canadian Type Certificate or Equivalent: H-92

Description of Design Change: Installation Of Cargo Basket / External Attachment Provisions
Installation Of Auxiliary Step

Required Equipment and Limitations:

Bell 407 Only:

Configuration A – External Attachment Provisions Only: 20

Installation of the External Attachment Provisions is to be completed in accordance with Transport Canada approved, AERO Design Ltd., Document Control List DCL606, Rev. 1, dated 16 July 2004, or later approved revision, or Document Control List DCL606-1, Revision 0, dated 1 February 2005, or later approved revision (depending on which basket configuration is installed).

Transport Canada approved, AERO Design Ltd., Maintenance Instructions MI 606.01, Revision 1, dated 16 July 2004 is required with this installation. 2 19

External Attachment Provisions installed in accordance with drawing 60602 may remain installed if the basket installation is removed.

(see continuation sheet...)

Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated will not adversely affect the airworthiness of the modified product.

For the Minister of Transport

Continuation Sheet

Approval Number: SH00-48

Issue Number: 4

Date of Approval: 8 December, 2000

Date of Issue: 16 August, 2004

Approval Data (Continued):

NOTE: THIS ADDENDUM SHALL REMAIN PART OF THE CERTIFICATE REFERRED TO THEREIN.

Bell 407 Only (Continued):

Configuration B – External Cargo Basket Installation (Low Mounted):

Installation of Configuration A, External Attachment Provisions, is a prerequisite for installation of Configuration B, External Cargo Basket Installation. Installation of the External Cargo Basket is to be completed in accordance with Transport Canada Approved, AERO Design Ltd., Document Control List DCL606, Revision 1, dated 16 July 2004, or later approved revision. High skid gear is required for the basket installation. Placard is required on the basket lid. 20

Transport Canada approved, AERO Design Ltd., Flight Manual Supplement FMS 606.01, Revision 1, dated 01 February, 2005 is required with this installation.

Transport Canada approved, AERO Design Ltd., Maintenance Instructions MI 606.01, Revision 1, dated 16 July 2004 is required with this installation. 2 19

Basis of Certification is as defined by the applicable Type Certificate Data Sheets.

Configuration C – External Cargo Basket Installation (High Mounted):

Installation of Configuration A, External Attachment Provisions, is a prerequisite for installation of Configuration C, External Cargo Basket Installation. Installation of the External Cargo Basket is to be completed in accordance with Transport Canada Approved, AERO Design Ltd., Document Control List DCL606-1, Revision 0, dated 1 February 2005, or later approved revision. Approved emergency exit "push-out" windows or an approved sliding door are required on the side of the helicopter that the basket is installed on if passengers are to be carried. Placard is required on the basket lid.

Transport Canada approved, AERO Design Ltd., Flight Manual Supplement FMS 606.01, Revision 1, dated 01 February 2005 is required with this installation.

Transport Canada approved, AERO Design Ltd., Maintenance Instructions MI 606.01, Revision 1, dated 16 July 2004 is required with this installation.

Basis of Certification is as defined by the applicable Type Certificate Data Sheets.

Bell 206L, L-1, L-3, L-4 Only:

Configuration A – External Attachment Provisions Only:

Installation of the External Attachment Provisions is to be completed in accordance with Transport Canada approved, AERO Design Ltd., Document Control List DCL493, Rev. 5, dated 16 July 2004, or later approved revision. 18

Transport Canada approved, AERO Design Ltd., Flight Manual Supplement FMS 493.01, dated 19 May 2002 is required with this installation.

Transport Canada approved, AERO Design Ltd., Maintenance Instructions MI 493.01, Revision 1, dated 16 July 2004 is required with this installation. 2 19

External Attachment Provisions installed in accordance with DCL493 may remain installed if the basket installation is removed.

Continuation Sheet

Approval Number: SH00-48

Issue Number: 4

Date of Approval: 8 December, 2000

Date of Issue: 16 August, 2004

Approval Data (Continued):

NOTE: THIS ADDENDUM SHALL REMAIN PART OF THE CERTIFICATE REFERRED TO THEREIN.

Configuration B – External Cargo Basket Installation (Low Mounted):

Installation of Configuration A, External Attachment Provisions, is a prerequisite for installation of Configuration B, External Cargo Basket Installation. Installation of the cargo basket is to be completed in accordance with Transport Canada Approved, AERO Design Ltd., Document Control List DCL492, Revision 4, dated 16 July 2004, or later approved revision. High skid gear is required for the basket installation. Placard is required on the basket lid.

Transport Canada approved, AERO Design Ltd., Flight Manual Supplement FMS 492.01, Revision 1, dated 25 June 2002 is required with this installation.

Transport Canada approved, AERO Design Ltd., Maintenance Instructions MI 492.01, Revision 2 dated 16 July 2004 is required with this installation.

Basis of Certification is as defined by the applicable Type Certificate Data Sheets, plus FAR 27 at amendment 27-24.

All Models (Bell 206L Series and 407):

Auxiliary Step Installation:

Installation of the Auxiliary Step is to be completed in accordance with Transport Canada approved, AERO Design Ltd., Document Control List DCL623, Rev. 0, dated 1 February 2005, or later approved revision.

The Auxiliary Step is optional and is not required with installation of Configuration B or C.

Auxiliary Step installed in accordance with DCL623 may remain installed if the basket installation is removed.

Basis of Certification is as defined by the applicable Type Certificate Data Sheets.

25 NOV 05

WAYNE TASMAN

5455 AIRPORT RD S.
RICHMOND, B.C.
V7B 1B5

SENT SPRINGS (2 SETS)

Date **05/24/2005**

Shippers #

Purchase Order #

Quote #

Edmonton, Alberta Canada T5V 1L6
Office & Rates 452-3366
Dispatch 454-2299 Fax 452-4091
Toll Free 1-888-333-3990



ATTN: ROGER
FROM AERO DESIGN LTD.
Calgary, Alberta Canada T2C 1V4
Office & Rates 236-5600
Dispatch 236-0855 Fax 236-1006
Toll Free 1-888-338-3311

Shippers Account #		•BILL OF LADING• NOT NEGOTIABLE		Consignees Account #	
Shipper (From)		Consignee (to)			
AERO DESIGN LTD.		NORTHERN AIR SUPPORT			
Street		Street			
2013 39th Ave NE		HLD FOR PICK UP (403) 845-6284			
City		City		Province / State	
CALGARY		ROCKY MOUNTAIN HOUSE AB		P.C. or Zip	
Province / State		Province / State		P.C. or Zip	
AB		AB			
Bill To Name		City		Province / State	
				P.C. or Zip	
Bill To Account Number		Routing			

No. of Pieces	Description of Articles, Special Marks and Exceptions	Weight (Pounds)	Dangerous Goods		
			Class	P.I.N.	Pck Grp
1	METAL BASKET	90			
Special Instructions		If At Shipper's Risk, Write or Stamp Here			

Freight Charges

Prepaid
or
Collect

Please circle one
 If not indicated
 shipment will move
 collect

C.O.D.

Cash on Delivery

\$

COD Fee

Prepaid ☐

Collect ☐

CONNECTING CARRIER
 PLEASE PROTECT
 ADVANCE CHARGES

\$

GST #89069-1256RT

Emergency Response Telephone #	Type of Placard	Quantity	Emergency Response Plan #

Dimensions	Total Cubic Feet
L 92" W 24" H 18"	

Declared Valuations \$

MAXIMUM LIABILITY OF \$2.00 PER POUND (\$4.41 PER KILOGRAM) COMPILED
 ON THE TOTAL WEIGHT OF THE SHIPMENT, UNLESS DECLARED VALUATION
 STATES OTHERWISE (CONDITIONS 9 AND 10 ON BACK)

RECEIVED AT THE POINT SHOWN ON THE DATE SPECIFIED AND FROM THE SHIPPER MENTIONED HEREIN, THE PROPERTY HEREIN DESCRIBED IN APPARENT GOOD ORDER, EXCEPT AS NOTED (CONTENTS AND CONDITIONS OF CONTENTS OF PACKAGES UNKNOWN) MARKED, CONSIGNED AND DESTINED AS INDICATED ABOVE, WHICH SAID CARRIER AGREES TO CARRY AND DELIVER TO THE SAID CONSIGNEE AT THE SAID DESTINATION IF ON ITS OWN ROUTE, OTHERWISE TO DELIVER TO ANOTHER CARRIER ON THE ROUTE TO SAID DESTINATION, SUBJECT TO THE CLASSIFICATION AND TARIFFS IN EFFECT ON THE DATE OF SHIPMENT. IT IS MUTUALLY AGREED AS TO EACH CARRIER OF ALL OR ANY OF SAID PROPERTY OVER ALL OR ANY PORTION OF SAID ROUTE TO DESTINATION, AND AS TO EACH PARTY AT ANY TIME INTERESTED IN ALL OR ANY OF SAID PROPERTY, THAT EVERY SERVICE TO BE PERFORMED HEREUNDER SHALL BE SUBJECT TO ALL THE CONDITIONS NOT PROHIBITED BY LAW, WHETHER PRINTED OR WRITTEN, INCLUDING CONDITIONS ON BACK HEREOF, WHICH ARE HERE AGREED TO BY THE SHIPPER AND ACCEPTED FOR HIMSELF AND HIS ASSIGNS.

THE CONTRACT FOR THE CARRIAGE OF THE GOODS LISTED IN THIS BILL OF LADING IS, BY REGULATION PASSED UNDER THE MOTOR CARRIER ACT, DEEMED TO CONTAIN AND BE SUBJECT TO CONDITIONS SET OUT IN THE REGULATION, INTEREST WILL BE CHARGED ON OVERDUE ACCOUNTS AT 1.5% PER MONTH (18% PER ANNUM). FREIGHT BILLS ARE PAYABLE WITHIN 7 DAYS.

NOTICE OF CLAIM

ARTICLE 12a - THE CARRIER SHALL NOT BE LIABLE FOR LOSS, DAMAGE OR DELAY TO ANY OF THE GOODS TRANSPORTED PURSUANT TO THIS BILL OF LADING UNLESS NOTICE THEREOF SETTING OUT PARTICULARS OF THE ORIGIN, DESTINATION AND DATE OF SHIPMENT OF THE GOODS AND THE ESTIMATED AMOUNT CLAIMED IN RESPECT OF SUCH LOSS, DAMAGE OR DELAY IS GIVEN IN WRITING TO THE ORIGINATING CARRIER (OR THE DELIVERING CARRIER) WITHIN 60 DAYS AFTER THE DELIVERY OF THE GOODS, OR IN THE CASE OF FAILURE TO MAKE DELIVERY WITHIN NINE MONTHS FROM THE DATE OF SHIPMENT OF THE GOODS.

ARTICLE 12b - THE FINAL STATEMENT OF THE CLAIM SHALL BE FILED WITHIN NINE (9) MONTHS FROM THE DATE OF SHIPMENT, TOGETHER WITH A COPY OF THE PAID FREIGHT BILL.

Shipper
Per
Pcs
Date

VAN KAM FREIGHTWAYS LTD.	
6148096	

DRIVERS TO COMPLETE THIS AREA	
Carrier	Driver #
Mustang Freightways Ltd.	
Driver Name (please print)	Requires
	S ____ C ____
Date	Time In:
2005 05 26	
Piece Count:	Time Out:
Unit #	Trailer #

Settin' the Pace

www.mustangfreight.com

BILL OF LADING NO.

214494

CUSTOMER (COPY 2)

Date 02/11/05

Shippers # 100

Purchase Order # 100 Quote # 100

Edmonton, Alberta Canada T5V 1L6
Office & Rates 452-3366
Dispatch 454-2299 Fax 482-4091
Toll Free 1-888-333-3990



ATTN: CARRIE

Calgary, Alberta Canada T2C 1V4
Office & Rates 236-5600
Dispatch 236-0855 Fax 236-1006
Toll Free 1-888-338-3311

Shippers Account #		•BILL OF LADING• NOT NEGOTIABLE		Consignees Account #	
Shipper (From) <u>Mustang Design Ltd</u>		Consignee (to) <u>WILDCAT HELICOPTERS</u>			
Street <u>200 34th Ave NE</u>		Street <u>2131 DOMINION RD</u>			
City <u>Edmonton</u>	Province / State <u>AB</u>	P.C. or Zip <u>T6E 6K7</u>	City <u>KENILDA</u>	Province / State <u>BC</u>	P.C. or Zip <u>V1Z 2H4</u>
Bill To Name	Street	City	Province / State	P.C. or Zip	
Bill To Account Number	Routing				

No. of Pieces	Description of Articles, Special Marks and Exceptions	Weight (Pounds)	Dangerous Goods		
			Class	P.I.N.	Pck Grp
1	<u>WALL BASKET</u>	<u>110</u>			
Special Instructions			If At Shipper's Risk, Write or Stamp Here		

Freight Charges

**Prepaid
or
Collect**

Please circle one
If not indicated
shipment will move
collect

C.O.D.

Cash on Delivery

\$

COD Fee

Prepaid ☐

Collect ☐

CONNECTING CARRIER
PLEASE PROTECT
ADVANCE CHARGES

\$

GST #89069-1256RT

Emergency Response Telephone #	Type of Placard	Quantity	Emergency Response Plan #
--------------------------------	-----------------	----------	---------------------------

Dimensions L <u>14</u> W <u>10</u> H <u>10</u>	Total Cubic Feet
---	------------------

Declared Valuations \$

MAXIMUM LIABILITY OF \$2.00 PER POUND (\$4.41 PER KILOGRAM) COMPUTED ON THE TOTAL WEIGHT OF THE SHIPMENT, UNLESS DECLARED VALUATION STATES OTHERWISE (CONDITIONS 9 AND 10 ON BACK)

RECEIVED AT THE POINT SHOWN ON THE DATE SPECIFIED AND FROM THE SHIPPER MENTIONED HEREIN, THE PROPERTY HEREIN DESCRIBED IN APPARENT GOOD ORDER, EXCEPT AS NOTED (CONTENTS AND CONDITIONS OF CONTENTS OF PACKAGES UNKNOWN) MARKED, CONSIGNED AND DESTINED AS INDICATED ABOVE, WHICH SAID CARRIER AGREES TO CARRY AND DELIVER TO THE SAID CONSIGNEE AT THE SAID DESTINATION IF ON ITS OWN ROUTE, OTHERWISE TO DELIVER TO ANOTHER CARRIER ON THE ROUTE TO SAID DESTINATION, SUBJECT TO THE CLASSIFICATION AND TARIFFS IN EFFECT ON THE DATE OF SHIPMENT. IT IS MUTUALLY AGREED AS TO EACH CARRIER OF ALL OR ANY OF SAID PROPERTY OVER ALL OR ANY PORTION OF SAID ROUTE TO DESTINATION, AND AS TO EACH PARTY AT ANY TIME INTERESTED IN ALL OR ANY OF SAID PROPERTY, THAT EVERY SERVICE TO BE PERFORMED HEREUNDER SHALL BE SUBJECT TO ALL THE CONDITIONS NOT PROHIBITED BY LAW, WHETHER PRINTED OR WRITTEN, INCLUDING CONDITIONS ON BACK HEREOF, WHICH ARE HERE AGREED TO BY THE SHIPPER AND ACCEPTED FOR HIMSELF AND HIS ASSIGNS

THE CONTRACT FOR THE CARRIAGE OF THE GOODS LISTED IN THIS BILL OF LADING IS, BY REGULATION PASSED UNDER THE MOTOR CARRIER ACT, DEEMED TO CONTAIN AND BE SUBJECT TO CONDITIONS SET OUT IN THE REGULATION, INTEREST WILL BE CHARGED ON OVERDUE ACCOUNTS AT 1.5% PER MONTH (18% PER ANNUM). FREIGHT BILLS ARE PAYABLE WITHIN 7 DAYS.

NOTICE OF CLAIM

ARTICLE 12a - THE CARRIER SHALL NOT BE LIABLE FOR LOSS, DAMAGE OR DELAY TO ANY OF THE GOODS TRANSPORTED PURSUANT TO THIS BILL OF LADING UNLESS NOTICE THEREOF SETTING OUT PARTICULARS OF THE ORIGIN, DESTINATION AND DATE OF SHIPMENT OF THE GOODS AND THE ESTIMATED AMOUNT CLAIMED IN RESPECT OF SUCH LOSS, DAMAGE OR DELAY IS GIVEN IN WRITING TO THE ORIGINATING CARRIER (OR THE DELIVERING CARRIER) WITHIN 60 DAYS AFTER THE DELIVERY OF THE GOODS, OR IN THE CASE OF FAILURE TO MAKE DELIVERY WITHIN NINE MONTHS FROM THE DATE OF SHIPMENT OF THE GOODS

ARTICLE 12b - THE FINAL STATEMENT OF THE CLAIM SHALL BE FILED WITHIN NINE (9) MONTHS FROM THE DATE OF SHIPMENT, TOGETHER WITH A COPY OF THE PAID FREIGHT BILL.

Shipper <u>Mustang</u>
Per <u>Clare</u>
Pcs
Date

VAN KAM FREIGHTWAYS LTD.

STICKER LABEL

5845093

DRIVERS TO COMPLETE THIS AREA	
Carrier Mustang Freightways Ltd.	Driver # <u>1111</u>
Driver Name (please print) <u>Mustang</u>	Requires S <u> </u> C <u> </u>
Date <u>02/11/05</u>	Time In: <u> </u>
Piece Count: <u>1</u>	Time Out: <u> </u>
Unit # <u>02</u>	Trailer # <u> </u>

Settin' the Pace

www.mustangfreight.com

BILL OF LADING NO.

214493

CUSTOMER (COPY 2)

Aero Design

From: "Staal, Jack" <STAALJ@tc.gc.ca>
To: "Steve Fahey (E-mail)" <steve.aerodesign@telusplanet.net>
Sent: April 13, 2005 1:22 PM
Subject: C-01-0194, Cargo Basket, Bell 407

Hi Steve,

I need one change to the FMS 606.01

Add to the limitations section:

6. High Basket configuration - No occupants in the passenger cabin unless aircraft is equipped with approved push out emergency windows or sliding door on the basket side of the aircraft.

Thanks,

J.H. (Jack) Staal

Aircraft Certification Technologist | Technologue, Certification des aeronefs.
Prairie and Northern Region | Region des Prairies et du Nord

Telephone | telephone: (780)495-5227
Facsimilie | telecopier: (780)495-7963
Email | courriel: staalj@tc.gc.ca
TTY / ATS : 1-888-675-6863

Transport Canada | Transports Canada
1100- 9700, Jasper Avenue | avenue Jasper (RAED)
Edmonton, AB T5J 4E6
Government of Canada | Gouvernement du Canada

03 February, 2005

Transport Canada
Aircraft Certification Division
11th Floor, Canada Place
9700 Jasper Avenue
Edmonton, Alberta
T5J 4E6

Attn: Jack Staal

Your File # : C-02-0218

Our File # : 606/623

Re: Revision Of Sh00-48

Jack,

This STC is amended to replace the existing high mounted basket configuration for the Bell 407's. The basket is about the same size as the original high mounted basket. Some drawings are updated and corrected. An auxilliary step installation package is included. Please find attached the following documents related to this project:

Draft STC	SH00-48	Issue 4
Modification Approval Request Application Form	MOD606-1	Revision 0
Compliance Program	CP606-1	Revision 0
Project Summary	PS606	Revision 1
Document Control List	DCL606-1	Revision 0
AE-100 Form	AE606-1	Revision 0
Engineering Report	ER 606.01	Revision 0
Engineering Report	ER 606.02	Revision 0
Engineering Report	ER 606.03	Revision 0
Test Report	TR 606.04	Revision 0
Test Report	TR 606.05	Revision 0
Engineering Report	ER 492.01	Revision 0
Engineering Report	ER 492.02	Revision 0
Engineering Report	ER 493.01	Revision 1
Engineering Report	ER 493.03	Revision 0
Engineering Report	ER 362.02	Revision 2
Maintenance Instructions	MI 606.01	Revision 2
Flight Manual Supplement	FMS 606.01	Revision 1
Installation Drawing, 407 High Basket	60603	Revision 0
Installation Drawing, 407 Provisions	60602	Revision 0
Fabrication Drawing	60620	Revision 0
Fabrication Drawing	60621	Revision 0
Fabrication Drawing	60622	Revision 0

AERO DESIGN LTD.

2013 – 39 Avenue N.E., Calgary, Alberta, T2E 6R7

Tel: 403-250-8027

Fax: 403-250-8333

aerodesign@telusplanet.net

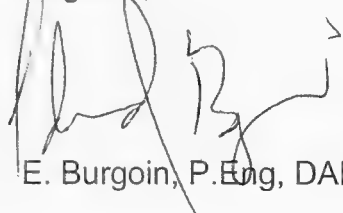
Fabrication Drawing	60624	Revision 0
Fabrication Drawing	60630	Revision 0
Fabrication Drawing	60631	Revision 0
Fabrication Drawing	60632	Revision 0
Fabrication Drawing	60640	Revision 0
Fabrication Drawing	60641	Revision 0
Fabrication Drawing	60642	Revision 0
Fabrication Drawing	60643	Revision 0
Fabrication Drawing	60644	Revision 0
Fabrication Drawing	60646	Revision 0
Fabrication Drawing	60647	Revision 0
Fabrication Drawing	60648	Revision 0
Fabrication Drawing	60649	Revision 0
Fabrication Drawing	49212	Revision 0
Fabrication Drawing	49213	Revision 1
Fabrication Drawing	49215	Revision 0
Fabrication Drawing	49216	Revision 0
Fabrication Drawing	49218	Revision 0
Fabrication Drawing	49221	Revision 2
Fabrication Drawing	36255	Revision 1
Fabrication Drawing	36261	Revision 1
Fabrication Drawing	36262	Revision 1
Fabrication Drawing	36271	Revision 0
Fabrication Drawing	36272	Revision 0
Fabrication Drawing	36273	Revision 0
Fabrication Drawing	36274	Revision 0
Fabrication Drawing	36275	Revision 1
Fabrication Drawing	36276	Revision 0
Fabrication Drawing	36277	Revision 0
Fabrication Drawing	36278	Revision 1
Fabrication Drawing	36280, Sheet 1	Revision 2
Fabrication Drawing	36280, Sheet 2	Revision 2
Auxilliary Step		
Compliance Program	CP623	Revision 0
Project Summary	PS623	Revision 0
Document Control List	DCL623	Revision 0
AE-100 Form	AE623	Revision 0
Engineering Report	ER623.01	Revision 0
Installation Drawing	62301	Revision 0
Fabrication Drawing	62320	Revision 1

Further to our discussions before Christmas on the subject we have taken the following approach to showing compliance with the regulatory requirements.

- a) The basket itself was load tested again to show compliance with combined drag and maneuvering load structural requirements. The drag load applied was considerably over-stated to include the 4g forward emergency landing condition. This was done because the interface between the basket and the fore and aft beams are double 1/8" aluminum plates that I didn't feel comfortable with the analysis on. Since we were load testing to show compliance for these plates it was simple to put the whole basket into the test.
- b) A load test was done on a scrap section of beam to show that for the 4g forward emergency landing condition, the beam did not permanently deform sufficiently to block the pilot's door for emergency egress. The beam was treated as a simple cantilever with a normal load applied at the outer end which is conservative since in an actual installation the basket will restrain the outer end of the beam from rotating and cause the beam to be S bent in the middle. This test was necessary because we moved the basket out further in order to allow operation of passenger sliding doors if installed and provide approximately 6 inches of lateral clearance with the bottom of the "pop-out" window if installed.
- c) Emergency egress has been re-thought based on your comments. The support for the beams has been raised approximately three inches from the original 407 basket installation which has raised the entire basket. Although we have moved the basket out-board providing clearance for the pop-out window, we have trimmed down the height of the basket by three inches to bring the top of the lid back to the same height as was approved in the original configuration some years ago.
- d) The size and positioning of the basket is otherwise the same as the original basket installation and flight characteristics, control and performance are unchanged from the original approval.
- e) Interference with anti-collision and navigation lights remains unchanged from the previous approved configuration.

Trust you find this a reasonable approach. Call if you have questions.

Regards,



E. Burgoin, P.Eng, DAR 290M

Encl.

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

APPLICANT: AERO Design Ltd.
2013 39th Avenue NE
Calgary, Alberta, T2E 6R7

DATE: 17 January, 2005
REV. No. 0




CORRESPONDANCE TO:
(If other than applicant)

MAKE: Bell Helicopter
MODEL: 407

REGISTRATION: All Applicable
SERIAL No.: All Applicable

NATURE OF WORK: Installation of High Side-Mounted External Cargo Basket




MODEL CERTIFICATION BASIS: FAR 27, Amendment 27-30, with exceptions as noted below.
MODIFICATION CERTIFICATION BASIS: FAR 27, Amendment 27-30, with exceptions as noted below.

Airworthiness Requirement		Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
Paragraph	Amdt.					
Subpart B – Flight						
27.27	30	Centre of Gravity Limits	N/A			X  No change from Type Approval.
27.29	30	Empty Weight and Corresponding C of G	Data specified on inst'n drawing		X	
27.51	30	Takeoff	Flight Test	X		Flight tests performed using similar baskets Bell 407 and 206L to satisfy the flight test requirements. Limitations established in previous flight tests to be used with this installation.
27.65	30	Climb: All Engines Operating	Flight Test	X		
27.71	30	Gliding Performance	Flight Test	X		
27.75	30	Landing	Flight Test	X		
27.141	30	Flight Characteristics – General	Flight Test	X		
27.143	30	Controllability and Maneuverability	Flight Test	X		
27.151	30	Flight controls	Flight Test	X		
27.161	30	Trim	Flight Test	X		
27.171	30	Stability – General	Flight Test	X		
27.173	1	Longitudinal Stability	Flight Test	X		
27.175	1	Demonstration of Longitudinal Stability	Flight Test	X		
27.177	30	Static Directional Stability	Flight Test	X		
27.241	30	Ground Resonance	Flight Test	X		
27.251	30	Vibration	Flight Test	X		
Subpart C – Strength Requirements						
27.301	30	Loads – Air Drag Loads	Analysis and Test iaw AC 43.13-1A	X		X  X 
27.301	30	Loads – Inertia Loads	Compliance with 27.337 and 27.561			

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

Airworthiness Requirement	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
Paragraph	Amdt.				
27.303	30	Factor of Safety		X/B	
27.305	30	Strength and Deformation		X/B	
27.307	30	Proof of Structure		X/B	
27.337(a)	30	Limit Maneuvering Load Factor – Positive		X/B	Critical load factor in downward direction.
27.471	30	Ground Loads - General	X		Same landing gear fittings/attachments as previously approved
27.473	30	Ground Loading Conditions and Assumptions			No change to assumptions used for Type Approved configuration
27.501	30	Ground Loading Conditions – Landing Gear with Skids			Loads from the cargo basket on the landing gear fittings do not use skid tubes or cross tubes in load path.
27.547	30	Main Rotor Structure	X		See comments for flight test above
27.561	30	Emergency Landing Conditions		X/B	
27.561(b)3(i)	24	Emergency Landing Conditions – Up		X/B	
27.561(b)3(ii)	24	Emergency Landing Conditions – Fwd		X/B	
27.561(b)3(iii)	24	Emergency Landing Conditions – Side		X/B	
27.561(b)3(iv)	24	Emergency Landing Conditions – Down		X/B	27.337 Maneuvering Load is Critical.
Subpart D – Design and Construction					
27.601	30	Design		X/B	Design is conventional.
27.603	30	Materials		X/B	Materials used are specified in Mil-Hdbk-5H.
27.605	30	Fabrication Methods		X/B	Design is conventional.
27.609	30	Protection of Structure		X/B	
27.611	30	Inspection Provisions		X/B	Design is easy to inspect.
27.613	30	Material Strength Properties and Design Values		X	
27.625	30	Fitting Factor		X/B	Ref. TCDS Equivalent Safety Finding. Same landing gear fittings/attachments as previously approved. Loads from the cargo basket on the landing gear fittings do not use skid tubes or cross tubes in load path.
27.725	30	Limit Drop Test			
27.727	30	Reserve Energy Absorption Drop Test			
27.783	30	Doors		X/B	Installation does not block pilot door, sliding door or push out window req. on passenger door
27.787(a)	30	Cargo and Baggage Compartments		X/B	
27.787(b)	30	Cargo and Baggage Compartments		X/B	Basket is a closed container.
27.787(c), (d)	30	Cargo and Baggage Compartments			Cargo is external to helicopter.

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

Airworthiness Requirement		Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
Paragraph	Amdt.					
27.807	30	Emergency Exits	Statement in report		X 	
27.865(a)	30	External Load Attaching Means	Compliance with 27.337		X 	
27.865(b), (c)	30	External Load Attaching Means	N/A			
27.865(d)	30	External Load Attaching Means	N/A			Failure of an attachment does not endanger the rotorcraft.
27.1387	30	Position Light System Dihedral Angles	N/A			No change from Type Approval.
27.1401	30	Anticollision Light System	N/A	X		Light located at FS 396, WL 130 on vertical fin. No change from approved configuration, reference drawing 36201
Subpart G – Operating Limitations and Information						
27.1505	30	Never Exceed Speed	Flight Test,	X		V _{NE} limits as specified in the existing Flight Manual (140 kts.)
27.1525	30	Kinds of Operation	Flight Manual Supplement	X		Limited to VFR only.
27.1529	30	Instructions for Continuing Airworthiness	Maintenance Instructions	X		Maintenance instructions provided
27.1557(a)	30	Miscellaneous Markings and Placards – Baggage Compartments	Placard		X 	
27.1557(b)	30	Miscellaneous Markings and Placards	N/A			
27.1557(c)	30	Miscellaneous Markings and Placards	N/A			
27.1557(d)	30	Miscellaneous Markings and Placards	N/A			
27.1581	30	Rotorcraft Flight Manual – General	Flight Manual Supplement	X		
27.1583(c)	30	Operating Limitations – Weight and Loading Information	Flight Manual Supplement	X		
27.1585	30	Operating Procedures	Flight Manual Supplement	X		
27.1587	30	Performance Information	Flight Manual Supplement	X		
27.1589	30	Loading Information	Flight Manual Supplement & Placard	X		Placard installed on basket lid
Airworthiness Manual Requirements						
527.1581(e)		Rotorcraft Flight Manual – Units	SI and Imperial Units provided in Flight Manual Supplement	X		

BELL 407

ROTORCRAFT FLIGHT MANUAL SUPPLEMENT for the **INSTALLATION of the AERO DESIGN CARGO BASKET**

Supplemental Type Certificate No. SH00-48

Sections I, II, III and IV of this document comprise the Transport Canada Approved sections of this Flight Manual Supplement. Compliance with Section I, Limitations, is mandatory.

Section V and any subsequent sections if present are Unapproved and are provided for information only.

The information and data contained in this Flight Manual Supplement supersede or supplement that contained in the basic Approved Flight Manual for the Bell 407 when fitted with the Cargo Basket Installation. For limitations, procedures and performance not listed in this Flight Manual Supplement, refer to the Approved Flight Manual and other approved Flight Manual Supplements.

Table of Contents

I	Limitations	3
II	Normal Procedures	3
III	Emergency Procedures	3
IV	Performance	4
V	Weight and Balance	5

I LIMITATIONS

1. The maximum load in the AERO Design Ltd. Cargo Basket is 200 Lb. (90.9 kg).
2. Flight operations limited to VFR conditions with AERO Design Ltd. Cargo Basket installed.
3. Maximum lateral or rearward speed limited to 25 KIAS.
4. Maximum winds from aft quadrants limited to 25 KIAS for takeoff, landing or hover flight.
5. V_{NE} is 140 KIAS except when the V_{NE} of the basic rotorcraft is more restrictive, in which case the lower V_{NE} applies.

II NORMAL PROCEDURES

1. Pre-flight inspections:
 - a) Ensure that all cargo stored in the cargo basket does not extend outside the basket, is properly tied down and secured for flight.
 - b) Ensure that the lid of cargo basket is closed and secured.

CAUTION

It is possible to exceed the lateral centre of gravity limits of the rotorcraft under some loading conditions. Pilots must ensure that lateral C of G is within limits when loading the basket.

III EMERGENCY PROCEDURES

No change from basic Approved Flight Manual.

CAUTION:

The rotorcraft glide angle is steeper than that of the basic helicopter when the AERO Design Ltd. Cargo Basket is installed.

IV PERFORMANCE

Climb performance may be reduced by up to 200 fpm.

Cruise speeds are reduced by approximately 10 kts. (11 mph).

V WEIGHT AND BALANCE

1. The following weight and balance are for the low mounted cargo basket configuration, installed in accordance with drawing 60601.

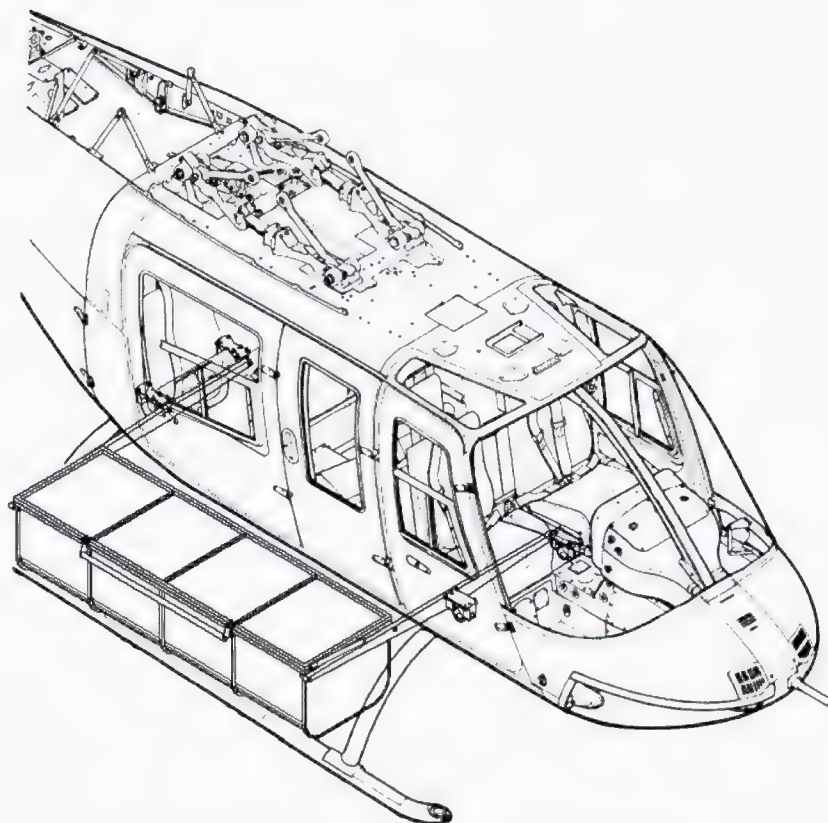


Figure 1 – Low Mounted Cargo Basket Configuration

Low Mounted Cargo Basket Configuration

English Units

Item	Weight (Lb)	Longitudinal		Lateral	
		Arm (in)	Moment (in*Lb)	Arm (in)	Moment (in*Lb)
Cargo Basket Installation	66.0	113.3	7476	30.5	2013
Cargo	200 (MAX)	114.1	22820	38.5	7700

Metric Units

Item	Weight (Kg)	Longitudinal		Lateral	
		Arm (mm)	Moment (mm*Kg)	Arm (mm)	Moment (mm*Kg)
Cargo Basket Installation	30,0	2878	86 314	775	23 241
Cargo	90.9 (MAX)	2898	263 467	978	88 900

Longitudinal and Lateral moment arms are given only for the center of the Cargo Basket. Due to the length of the basket, some loading arrangements may require that actual moment arms be measured, to determine the correct moments about the center of gravity.

CAUTION:

It is possible to exceed lateral CG limits in some configurations. For example, with one pilot, no passengers, fuel tanks half empty, and the AERO Design Ltd. cargo basket loaded with 200 pounds of cargo, the Lateral CG of the rotorcraft could be out of limits.

2. The following weight and balance are for the high mounted cargo basket configuration, installed in accordance with drawing 60603.

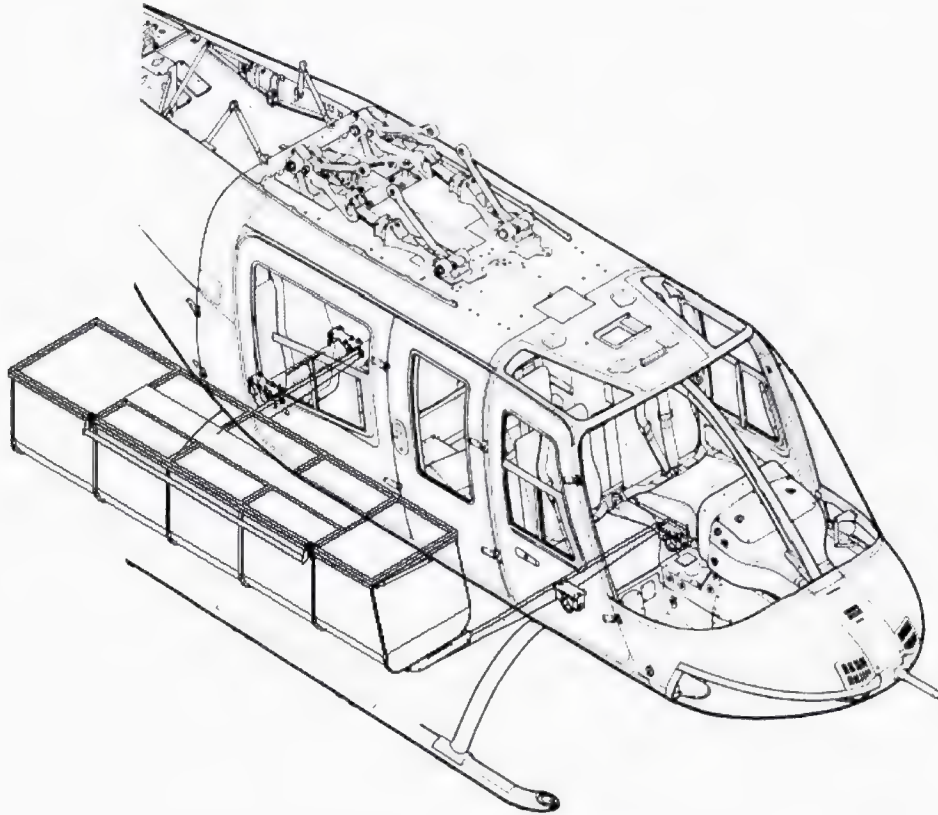


Figure 2 – High Mounted Cargo Basket Installation

High Mounted Cargo Basket Configuration

English Units

Item	Weight (Lb)	Longitudinal		Lateral	
		Arm (in)	Moment (in*Lb)	Arm (in)	Moment (in*Lb)
Cargo Basket Installation	86.5	121.0	10469	37.7	3258
Cargo	200 (MAX)	124.8	24960	46.8	9350

Metric Units

Item	Weight (Kg)	Longitudinal		Lateral	
		Arm (mm)	Moment (mm*Kg)	Arm (mm)	Moment (mm*Kg)
Cargo Basket Installation	39.1	3073	120 154	958	37 458
Cargo	90.9 (MAX)	3170	288 153	1189	108 080

Longitudinal and Lateral moment arms are given only for the center of the Cargo Basket. Due to the length of the basket, some loading arrangements may require that actual moment arms be measured, to determine the correct moments about the center of gravity.

CAUTION:

It is possible to exceed lateral CG limits in some configurations. For example, with one pilot, no passengers, fuel tanks half empty, and the AERO Design Ltd. cargo basket loaded with 200 pounds of cargo, the Lateral CG of the rotorcraft could be out of limits.



Department of Transport

Supplemental Type Certificate

This approval issued to:

AERO Design Ltd.
2013 - 39th Avenue NE
Calgary, Alberta
T2E 6R7

Approval Number: SH00-48

Issue Number.: 4

Date of Approval: 8 December, 2000

Date of Issue: 2 February, 2005

Responsible Office: Prairie and Northern

Aircraft / Engine Type: Bell

Registration: All Eligible

Model: 206L, L-1, L-3, L-4
407

Serial No.: All Eligible

Canadian Type Certificate or Equivalent: H-92

Description of Design Change: Installation Of Cargo Basket / External Attachment Provisions
Installation Of Auxiliary Step

Required Equipment and Limitations:

Bell 407 Only:

Configuration A – External Attachment Provisions Only:

Installation of the External Attachment Provisions is to be completed in accordance with Transport Canada approved, AERO Design Ltd., Document Control List DCL606, Rev. 1, dated 16 July 2004, or later approved revision, or Document Control List DCL606-1, Revision 0, dated 1 February 2005, or later approved revision (depending on which basket configuration is installed).

Transport Canada approved, AERO Design Ltd., Maintenance Instructions MI 606.01, Revision 1, dated 16 July 2004 is required with this installation.

External Attachment Provisions installed in accordance with drawing 60602 may remain installed if the basket installation is removed.

(see continuation sheet...)

Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated will not adversely affect the airworthiness of the modified product.

For the Minister of Transport

Continuation Sheet

Approval Number: SH00-48

Issue Number: 4

Date of Approval: 8 December, 2000

Date of Issue: 16 August, 2004

Approval Data (Continued):

NOTE: THIS ADDENDUM SHALL REMAIN PART OF THE CERTIFICATE REFERRED TO THEREIN.

Bell 407 Only (Continued):

Configuration B – External Cargo Basket Installation (Low Mounted):

Installation of Configuration A, External Attachment Provisions, is a prerequisite for installation of Configuration B, External Cargo Basket Installation. Installation of the External Cargo Basket is to be completed in accordance with Transport Canada Approved, AERO Design Ltd., Document Control List DCL606, Revision 1, dated 16 July 2004, or later approved revision. High skid gear is required for the basket installation. Placard is required on the basket lid.

Transport Canada approved, AERO Design Ltd., Flight Manual Supplement FMS 606.01, Revision 0, dated 25 March 2004 is required with this installation.

Transport Canada approved, AERO Design Ltd., Maintenance Instructions MI 606.01, Revision 1, dated 16 July 2004 is required with this installation.

Basis of Certification is as defined by the applicable Type Certificate Data Sheets.

Configuration C – External Cargo Basket Installation (High Mounted):

Installation of Configuration A, External Attachment Provisions, is a prerequisite for installation of Configuration C, External Cargo Basket Installation. Installation of the External Cargo Basket is to be completed in accordance with Transport Canada Approved, AERO Design Ltd., Document Control List DCL606-1, Revision 0, dated 1 February 2005, or later approved revision. Approved emergency exit "push-out" windows or an approved sliding door are required on the side of the helicopter that the basket is installed on if passengers are to be carried. Placard is required on the basket lid.

Transport Canada approved, AERO Design Ltd., Flight Manual Supplement FMS 606.01, Revision 0, dated 25 March 2004 (Bell 407) or Flight Manual Supplement FMS 492.01, Revision 1, dated 25 June 2002 (Bell 206L Series) is required with this installation.

Transport Canada approved, AERO Design Ltd., Maintenance Instructions MI 606.01, Revision 1, dated 16 July 2004 is required with this installation.

Basis of Certification is as defined by the applicable Type Certificate Data Sheets.

Bell 206L, L-1, L-3, L-4 Only:

Configuration A – External Attachment Provisions Only:

Installation of the External Attachment Provisions is to be completed in accordance with Transport Canada approved, AERO Design Ltd., Document Control List DCL493, Rev. 5, dated 16 July 2004, or later approved revision.

Transport Canada approved, AERO Design Ltd., Flight Manual Supplement FMS 493.01, dated 19 May 2002 is required with this installation.

Transport Canada approved, AERO Design Ltd., Maintenance Instructions MI 493.01, Revision 1, dated 16 July 2004 is required with this installation.

External Attachment Provisions installed in accordance with DCL493 may remain installed if the basket installation is removed.

Continuation Sheet

Approval Number: SH00-48

Issue Number: 4

Date of Approval: 8 December, 2000

Date of Issue: 16 August, 2004

Approval Data (Continued):

NOTE: THIS ADDENDUM SHALL REMAIN PART OF THE CERTIFICATE REFERRED TO THEREIN.

Configuration B – External Cargo Basket Installation (Low Mounted):

Installation of Configuration A, External Attachment Provisions, is a prerequisite for installation of Configuration B, External Cargo Basket Installation. Installation of the cargo basket is to be completed in accordance with Transport Canada Approved, AERO Design Ltd., Document Control List DCL492, Revision 4, dated 16 July 2004, or later approved revision. High skid gear is required for the basket installation. Placard is required on the basket lid.

Transport Canada approved, AERO Design Ltd., Flight Manual Supplement FMS 492.01, Revision 1, dated 25 June 2002 is required with this installation.

Transport Canada approved, AERO Design Ltd., Maintenance Instructions MI 492.01, Revision 2, dated 16 July 2004 is required with this installation.

Basis of Certification is as defined by the applicable Type Certificate Data Sheets, plus FAR 27 at amendment 27-24.

All Models (Bell 206L Series and 407):

Auxiliary Step Installation:

Installation of the Auxiliary Step is to be completed in accordance with Transport Canada approved, AERO Design Ltd., Document Control List DCL623, Rev. 0, dated 1 February 2005, or later approved revision.

The Auxiliary Step is optional and is not required with installation of Configuration B or C.

Auxiliary Step installed in accordance with DCL623 may remain installed if the basket installation is removed.

Basis of Certification is as defined by the applicable Type Certificate Data Sheets.

Title: High Side Mounted Cargo Basket
Approval: STC
Customer: AERO Design Ltd.
Type and Model: Bell 206L Series, 407

Definition Of Change:**Description:**

For heli-ski operations, a longer cargo basket is required to accommodate skis. Also, it is preferred that the basket is mounted above the bottom of the fuselage, because when the helicopter lands in loose powder snow, it will sink into the snow until the skid gear touches the ground or the bottom of the fuselage settles into the snow. If the basket is mounted low it will settle on the snow first, causing the helicopter to roll to the side.

This installation is intended to replace the high mounted configuration that is already on STC SH00-48. Approved push out windows are required when the basket is installed.

The installation will use the same attachment provisions and beams that were previously approved. Lugs are installed on the bottom of the basket. A mounting plate is used to attach the lugs to the beams.

Previous flight tests from the Bell 206L and 407 baskets have demonstrated the limitations required for the installation, and additional flight testing of this configuration is not necessary.

Primary Changes to the Aeronautical Product:

Installation of new forward landing gear fittings, installation of block in aft landing gear fittings, installation of beams and cargo basket.

Secondary Changes to the Aeronautical Product (Required as consequence of primary changes):**Other Relevant Modifications to the Aeronautical Product (Which impact on this change):**

Substantial Change Evaluation:

The scope of this change is not substantial.

Significant Change Evaluation:

Refer to AMA 500/16, Appendix A, Tables A.2.1 through A.5.6, as applicable.

- Yes ☐ No ☒ The change is an example on the table of Significant Changes.
Yes ☒ No ☐ The change is close to an example on the table of Significant Changes.
Yes ☐ No ☒ The change is an example on the table of Not-Significant Changes.
Yes ☐ No ☒ The change is close to an example on the table of Not-Significant Changes.
Yes ☒ No ☐ The change is not an example on the tables.

Example found: "A fuselage modification that changes the primary structure, aerodynamics, or operating envelope sufficiently to invalidate certification assumptions."

Service experience with this type of installation has shown that only minor changes to the operating envelope are required. The primary structure is not changed.

- A. Is the general configuration changed? Yes ☐ No ☒

A change to the general configuration at the product level that is likely to require a new model designation because of the need to distinguish the different product with other product models (eg. performance, interchangeability of major components etc).

Comments:

- B. Are the principles of construction changed? Yes ☐ No ☒

A change at the product level to the materials and/or construction methods that affects the overall product's operating characteristics or inherent strength.

Comments:

- C. Have the assumptions used for certification been invalidated? Yes ☐ No ☒

Changes to product level assumptions, either design or engineering, associated with product development, compliance demonstration, performance or operating envelope that by themselves are so different, that the original assumptions are invalidated and the existing substantiation cannot be extrapolated to cover the changed product.

Comments:

Basis of Certification of the Basic Aeronautical Product:

Bell 407, TCDS H-92

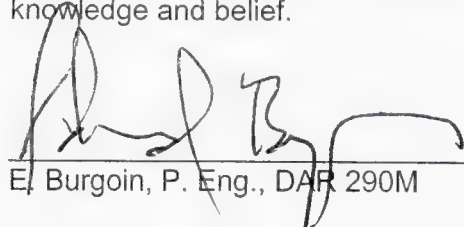
FAR part 27, dated October 2, 1964 Amendment 27-1 through 27-30; Paragraph 27.561(b)(3) at Amdt 27-24; Section 27.563 at Amdt. 27-25; Section 27.785 at Amdt 27-24; Section 27.1093 at amendment 27-8; and Section 27.173 and 27.175 at amendment 27-1.

Exemptions to FAR 27 are the deletion of sections: 27.562, 27.1195, and 27.952(b)(1)

Basis of Certification for the Change to the Aeronautical Product:

Same as the original basis of certification on the Type Certificate Data Sheet.

Under the authority vested in me by the Minister, I have examined the change in type design listed above according to the established procedures and hereby determine that it is not significant pursuant to subsection 511.13(3) or 513.07(3) of the CARS, to the best of my knowledge and belief.



E. Burgoin, P. Eng., DAR 290M

02 February, 2005
Date


DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
60603	Cargo Basket Installation	0
60602	External Attachment Provisions Installation (Bell 407)	0
FMS606.01	Flight Manual Supplement	1
MI606.01	Maintenance Instructions	2
FABRICATION DOCUMENTS		
60620	Block Fabrication	0
60621	Forward Fitting Fabrication	0
60622	Barrel Nut Fabrication	0
60624	Barrel Nut Fabrication	0
60630	Cargo Basket Assembly	0
60631	Cargo Basket Body	0
60632	Cargo Basket Lid	0
60640	Basket Components – Rim	0
60641	Basket Components – End Hoop Assembly	0
60642	Basket Components – Attachment Hoop Assembly	0
60643	Basket Components – Spine	0
60644	Basket Components – Lug	0
60646	Basket Components – Mounting Plate	0
60647	Basket Components – Bushing	0
60648	Basket Components – Hoop	0
60649	Basket Components – Step Brace	0
49212	Basket Components – Rim	0
49213	Basket Components – Lid Brace	1
49215	Basket Components – Lug	0
49216	Basket Components – Lug	0
49218	Placard	0
49221	Support Beams	2
APPROVAL:	ORIGINAL DATE: 01 February, 2005 REVISION DATE:	AERO DESIGN LTD. 2013 – 39 th Ave NE Calgary, Alberta T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333
	SHEET 1 OF 2	Bell 407 High Side-Mounted Cargo Basket Installation
	DCL606-1	Rev. 0

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
FABRICATION DOCUMENTS	(CONTINUED)	
36255	Handle Assembly	1
36261	Handle Bar Assembly	1
36262	Handle Bracket Assembly	1
36271	Handle Lever	0
36272	Basket Bracket	0
36273	Lid Bracket	0
36274	Bushing	0
36275	Bushing	1
36276	Spring Hook	0
36277	Handle Bar	0
36278	Spring	1
36280, Sheet 1	Brace	2
36280, Sheet 2	Brace	2
ENGINEERING DOCUMENTS		
ER606.01	Engineering Report – Basket Installation	0
ER606.02	Engineering Report – Load Test	0
ER606.03	Engineering Report – High Mounted Basket	0
TR606.04	Test Report – Beam Load Test	0
TR606.05	Test Report – Basket Assembly Load Test	0
ER492.01	Engineering Report – Basket Installation	0
ER492.02	Engineering Report – Basket Load Tests	0
ER493.01	Engineering Report – External Attachment Prov.	1
ER493.03	Test Report – Load Test External Attachment Prov.	0
ER362.02	Test Report – Basket Assembly Load Test	2
APPROVAL:	ORIGINAL DATE: 01 February, 2005 REVISION DATE:	AERO DESIGN LTD. 2013 – 39 th Ave NE Calgary, Alberta T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333
	SHEET 2 OF 2	Bell 407 High Side-Mounted Cargo Basket Installation
	DCL606-1	Rev. 0

FORM AE-100


DEPARTMENT OF TRANSPORT STATEMENT OF COMPLIANCE OF AIRCRAFT OR AIRCRAFT COMPONENTS WITH THE AIRWORTHINESS REQUIREMENTS			AE-100 No.: AE606-1 Initial Issue Date: 1 February, 2005 Revision: 0 Revision Date: Approval No.: SH00-48 Delegation No.: 290M Delegate Name: E. Burgoin Classification of Designee: Employer: AERO Design Ltd.		
Aircraft Mfrg: Bell Aircraft Model: 206L Series, 407 Registration: All Eligible		Model Type Airplane <input type="checkbox"/> Helicopter <input checked="" type="checkbox"/> Appliance <input type="checkbox"/> Component <input type="checkbox"/>			
LIST OF APPROVED REPORTS AND DATA					
Document Number		Document Title		Compliance Status	
DCL606-1	Revision 0	Document Control List and all documents referred to therein			
ER606.01	Revision 0	Engineering Report			
ER606.02	Revision 0	Test Report			
ER606.03	Revision 0	Engineering Report			
TR606.04	Revision 0	Test Report			
TR606.05	Revision 0	Test Report			
ER492.01	Revision 0	Engineering Report			
ER492.02	Revision 0	Test Report			
ER493.01	Revision 0	Engineering Report			
ER493.03	Revision 0	Test Report			
ER362.02	Revision 0	Test Report			
60602	Revision 0	External Attachment Provisions Installation			
60603	Revision 0	Cargo Basket Installation			
60620	Revision 0	Block Fabrication			
60621	Revision 0	Forward Fitting Fabrication			
60622	Revision 0	Barrel Nut Fabrication			
60624	Revision 0	Barrel Nut Fabrication			
60630	Revision 0	Cargo Basket Assembly			
60631	Revision 0	Cargo Basket Body			
60632	Revision 0	Cargo Basket Lid			
60640	Revision 0	Basket Components - Rim			
60641	Revision 0	Basket Components - End Hoop Assembly			
60642	Revision 0	Basket Components - Attachment Hoop Assembly			
60643	Revision 0	Basket Components - Spine			
60644	Revision 0	Basket Components - Lug			
		DATA APPROVED BY TRANSPORT CANADA			
FMS606.01	Revision 1	Flight Manual Supplement			
MI606.01	Revision 2	Maintenance Instructions			
CERTIFICATION					
UNDER THE AUTHORITY VESTED IN ME BY THE DEPARTMENT OF TRANSPORT, I HEREBY CERTIFY THAT THE DATA LISTED ABOVE AND ON THE ATTACHED SHEETS NUMBERED 2 HAVE BEEN EXAMINED IN ACCORDANCE WITH ESTABLISHED PROCEDURES AND FOUND TO COMPLY, TO THE BEST OF MY KNOWLEDGE AND BELIEF WITH THE PERTINENT COMPLIANCE REQUIREMENTS.					
I THEREFORE <input type="checkbox"/> RECOMMEND FOR APPROVAL OF THESE DATA					
<input checked="" type="checkbox"/> APPROVE THESE DATA					
 E. Burgoin, DAR 290M					

FORM AE-100

LIST OF APPROVED REPORTS AND DATA			
Document Number		Document Title	Compliance Status
60646	Revision 0	Basket Components - Mounting Plate	
60647	Revision 0	Basket Components - Bushing	
60648	Revision 0	Basket Components - Hoop	
60649	Revision 0	Basket Components - Step Brace	
49212	Revision 0	Basket Components - Rim	
49213	Revision 1	Basket Components - Lid Brace	
49215	Revision 0	Basket Components - Lug	
49216	Revision 0	Basket Components - Lug	
49218	Revision 0	Placard	
49221	Revision 2	Support Beams	
36255	Revision 1	Handle Assembly	
36261	Revision 1	Handle Bar Assembly	
36262	Revision 1	Handle Bracket Assembly	
36271	Revision 0	Handle Lever	
36272	Revision 0	Basket Bracket	
36273	Revision 0	Lid Bracket	
36274	Revision 0	Bushing	
36275	Revision 1	Bushing	
36276	Revision 0	Spring Hook	
36277	Revision 0	Handle Bar	
36278	Revision 1	Spring	
36280, Sht. 1/2	Revision 2	Brace	
36280, Sht. 1/2	Revision 2	Brace	

MODIFICATION APPROVAL REQUEST APPLICATION FORM

MOD606-1, Rev. 0

1. NAME AND ADDRESS OF APPLICANT: AERO Design Ltd. 2013 39th Ave NE Calgary, AB, T2E 6R7		2. IDENTIFICATION OF PRODUCT				
		MAKE: Bell		MODEL: 206L Series, 407		
ALL CORRESPONDANCE TO: AERO Design Ltd. 2013 39th Ave N.E. Calgary, AB T2E 6R7		SERIAL No.: All Eligible		REGISTRATION: All Eligible		
3. REQUEST FOR:						
A. SUPPLEMENTAL TYPE CERTIFICATE (STC)		<input type="checkbox"/>				
B. STC/STA REVISION		<input checked="" type="checkbox"/> STC/STA No. SH00-48				
C. LIMITED SUPPLEMENTAL TYPE CERTIFICATE (LSTC)		<input type="checkbox"/>				
D. LIMITED STC/STA REVISION		<input type="checkbox"/> LSTC/LSTA No.				
E. F.A.A. SUPPLEMENTAL TYPE CERTIFICATE		<input type="checkbox"/>				
F. F.A.A. STC REVISION		<input type="checkbox"/> STC No.				
G. FAMILIARIZATION OF F.A.A. STC		<input type="checkbox"/> STC No.				
H. REPAIR DESIGN APPROVAL (RDC)		<input type="checkbox"/>				
I. PARTS DESIGN APPROVAL (PDA)		<input type="checkbox"/>				
4. TITLE OF MODIFICATION OR REPAIR: Side Mounted Cargo Basket Installation						
5. BRIEF DESCRIPTION OF MODIFICATION OR REPAIR: This revision is to include two changes to the approval: 1) New configuration for mounting the cargo basket above the beams (normally used for operations in snow) (see PS606 Revision 1). 2) An optional installation of an auxilliary step to allow easier access to the forward doors (See PS 623, Revision 0).						
6. APPLICABLE TYPE APPROVAL (TA) OR TYPE CERTIFICATE (TC) DOCUMENTS:						
A. TA NO. H-92		B. TC No.		C. OTHER		
7. PROPOSED BASIS OF APPROVAL:						
A. SAME AS TA <input checked="" type="checkbox"/>		B. SAME AS TC <input type="checkbox"/>		C. OTHER <input type="checkbox"/> (Please specify)		
8. DOCUMENTATION CHECKLIST		REQUIRED		FOR DOT USE ONLY		
				RECEIVED		
		YES	NO	YES	NO	DATE
COMPLIANCE PROGRAM		X				
MASTER DRAWING LIST		X				
FLIGHT MANUAL SUPPLEMENT		X				
MAINTENANCE MANUAL SUPPLEMENT			X			
INSTRUCTIONS FOR CONTINUING AIRWORTHINESS		X				
ENGINEERING REPORTS			X			
DESIGN DRAWINGS			X			
MANUFACTURE DRAWINGS & INSTALLATION INSTRUCTIONS		X				
ELECTRICAL LOAD ANALYSIS			X			
DRAFT STC, LSTC OR RDA		X				
WEIGHT AND MOMENT CHANGE		X				
FLIGHT TEST DATA		X				
OTHER (Specify)						
9. APPLICANT'S REMARKS: Flight Manual Supplement and Instructions for continuing airworthiness are for basket only.						
10. In addition to the payment of Aircraft Certification approval fees as prescribed in Canadian Aviation Regulations (CAR) Section 104, I agree to reimburse Transport Canada incremental expenses as in Aviation Regulation Directive No. 3, or equivalent, as applicable. For further details governing cost recovery, refer to AMA 513/4.						
PER: 		Consultant		02 February, 2005		
SIGNATURE OF APPLICANTS		TITLE		DATE		
11.						
SIGNATURE OF REGIONAL ENGINEER		DATE				

AERO Design Ltd.

**ENGINEERING REPORT
ER606.03**

SIDE MOUNTED CARGO BASKET

Bell 206L Series and 407

Approved: E. Burgoin, P. Eng.

Prepared by: Jeff Clarke

Revision 0
Date: 18 January, 2005

AERO Design Ltd.
Engineering Consultants

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1.0 INTRODUCTION

For heli-ski operations, a longer cargo basket is required to accommodate skis. Also, it is preferred that the basket is mounted above the bottom of the fuselage, because when the helicopter lands in loose powder snow, it will sink into the snow until the skid gear touches the ground or the bottom of the fuselage settles into the snow. If the basket is mounted low it will settle on the snow first, causing the helicopter to roll to the side.

This installation is intended to replace the high mounted configuration that is already on STC SH00-48.

The installation will use the same attachment provisions and beams that were previously approved. Lugs similar to those installed near the top of the low mounted basket are installed on the bottom of this basket. A mounting plate is used to attach the bottom of the basket to the beams.

2.0 REFERENCE

AERO Design Ltd. Engineering Reports ER606.01, ER493.01

AERO Design Ltd. Test Reports TR362.02, TR606.02, TR606.04

AERO Design Ltd. Drawing 60603

3.0 BASIS OF CERTIFICATION

Bell 407, TCDS H-92 (Highest of Bell 206L series and 407):

FAR part 27, dated October 2, 1964 Amendment 27-1 through 27-30; Paragraph 27.561(b)(3) at Amdt 27-24; Section 27.563 at Amdt. 27-25; Section 27.785 at Amdt 27-24; Section 27.1093 at amendment 27-8; and Section 27.173 and 27.175 at amendment 27-1.

Exemptions to FAR 27 are the deletion of sections: 27.562, 27.1195, and 27.952(b)(1).

This installation:

Same as the basis of certification for the Bell 407 as shown on Type Certificate Data Sheet H-92.

Clarification was requested on the interpretation of FAR 27.787(b)(2) as it applies to FAR 27.561. Ruling from Transport Canada in e-mail dated 19 November, 2004, provides that the ultimate forward emergency landing load factor is 4g. See appendix A.

4.0 ANALYSIS OF CURRENT AIRWORTHINESS DIRECTIVES (AD'S)

There are no current AD's related to this installation. Refer to Appendix A of ER606.01 for a list of current AD's.

5.0 LOADS

BELL 407 HELICOPTER LOAD FACTORS, FAR 27:

FAR 27.561(c), amdelement 27-24

	Ultimate Upward Emergency Landing Load Factor:	$n_{e_up} := 1.5$
	Ultimate Forward Emergency Landing Load Factor:	$n_{e_fwd} := 4.0$
	Ultimate Sideward Emergency Landing Load Factor:	$n_{e_side} := 2.0$
	Ultimate Downward Emergency Landing Load Factor:	$n_{e_down} := 4.0$
FAR 27.625	Fitting Factor:	$n_{ff} := 1.15$
FAR 27.303	Safety Factor:	$n_{sf} := 1.5$
FAR 27.337(a)	Limit Positive Maneuvering LoadFactor:	$n_{man} := 3.5$
$n_{man_ult} := n_{man} \cdot n_{sf}$	Ultimate Positive Maneuvering LoadFactor:	$n_{man_ult} = 5.25$
	Limit Negative Maneuvering LoadFactor:	$n_{man_n} := -1.0$
$n_{man_neg_u} := n_{man_n} \cdot n_{sf}$	Ultimate Negative Maneuvering LoadFactor:	$n_{man_neg_u} = -1.5$

CRITICAL ULTIMATE LOAD FACTORS:

Downward:	Ultimate Positive Maneuvering LoadFactor:	$n_{man_ult} = 5.25$
Forward:	Ultimate Forward Emergency Landing Load Factor:	$n_{e_fwd} = 4.00$
Sideward:	Ultimate Sideward Emergency Landing Load Factor:	$n_{e_side} = 2.00$
Upward:	Ultimate Upward Emergency Landing Load Factor:	$n_{e_up} = 1.50$

Sideward and Upward deflection or failure of the basket in the emergency landing condition do not endanger the occupants. Sideward and Upward Load Factors are used in the tests to ensure that the lid of the basket does not open in flight.

DRAG LOAD ON BASKET

	Length of basket.	$l_{\text{basket}} := 96.5 \text{ in}$
	Width of basket.	$w_{\text{basket}} := 22 \text{ in}$
	Height of basket.	$h_{\text{basket}} := 17 \text{ in}$
	Frontal Area of basket.	$A_f := 352 \text{ in}^2$
$A_p := l_{\text{basket}} \cdot w_{\text{basket}}$	Planar Area of basket.	$A_p = 2123 \text{ in}^2$
	Fineness ratio of basket	$\frac{l_{\text{basket}}}{w_{\text{basket}}} = 4.4$
	Drag Coefficient of Basket, (overestimated) (Ref. Hoerner, Fluid Dynamic Drag, Chapter 3, Figure 22).	$C_{Do} := 1.5$
	Density of air at Sea Level.	$\rho := 0.002378 \frac{\text{slug}}{\text{ft}^3}$
	Never-Exceed-Speed of 407. (Ref. 407 Flight Manual.)	$V_{ne} := 140 \text{ knots}$
$V_d := \frac{V_{ne}}{0.9}$	Dive Speed of Bell 407	$V_d = 156 \text{ knots}$
$\text{Drag} := \frac{\rho}{2} \cdot V_d^2 \cdot A_f \cdot C_{Do}$	Limit drag on basket.	$\text{Drag} = 301 \text{ lbf}$
$P_{\text{drag_ult_test}} := \text{Drag} \cdot n_{sf}$	Ultimate applied drag load on basket if compliance shown by test	$P_{\text{drag_ult_test}} = 451 \text{ lbf}$
$P_{\text{drag_ult}} := \text{Drag} \cdot n_{sf} \cdot n_{ff}$	Ultimate applied drag load on basket if compliance shown by analysis	$P_{\text{drag_ult}} = 518 \text{ lbf}$
	Lateral Aerodynamic Center of basket.	$AC_{\text{drag}} := 46.75 \text{ in}$

LOADS ON BASKET

Weight of basket.	$W_{\text{basket}} := 60 \cdot \text{lbf}$
Cargo Capacity of basket.	$W_{\text{cargo}} := 200 \cdot \text{lbf}$
Fitting Factor (Not required where compliance is shown by test)	$n_{\text{ff}} = 1.15$

DOWNWARD:

The basket shall support its contents under the maximum maneuvering load factor.

Ultimate Positive Maneuvering Load Factor:	$n_{\text{man_ult}} = 5.25$
$P_{z_ult} := (W_{\text{basket}} + W_{\text{cargo}}) \cdot n_{\text{man_ult}}$	Ultimate Vertical Load on basket. $P_{z_ult} = 1365 \cdot \text{lbf}$

FORWARD:

Deflection of the basket, or shifting of its contents in the forward direction in an emergency landing does not endanger the occupants of the helicopter. However, forward deflection of the basket could block the pilot's door, so the forward load is required.

Ultimate Forward Emergency Load Factor:	$n_{e_fwd} = 4.00$
$P_{fwd_ult} := (W_{\text{basket}} + W_{\text{cargo}}) \cdot n_{e_fwd}$	Ultimate forward load on basket $P_{fwd_ult} = 1040 \cdot \text{lbf}$

SIDEWARD:

Deflection of the basket, or shifting of its contents in the sideward direction in an emergency landing does not endanger the occupants of the helicopter. However, to ensure that the lid of the basket cannot open during flight, the ultimate sideward load factor will be used. The handle latches the lid closed, and is retained by a torsion spring.

Ultimate Sideward Emergency Load Factor:	$n_{e_side} = 2.00$
--	----------------------

The handle must stay closed when pulled sideways with twice its weight.

UPWARD:

For attachment of the basket to the helicopter, the critical vertical load is downward, but this load factor will be used to ensure that the lid cannot open during flight or an emergency landing.

Ultimate Upward Emergency Load Factor:	$n_{e_up} = 1.50$
$P_{z_lid} := W_{\text{cargo}} \cdot n_{e_up}$	Ultimate Upward Load of cargo on lid. $P_{z_lid} = 300 \cdot \text{lbf}$

6.0 STRUCTURAL COMPLIANCE

This basket is of the same construction as other cargo baskets previously approved (refer to installation drawings 36201, 49201, 60601). Some of the tests previously performed are valid for this installation.

6.1 Basket Assembly

The basket assembly must be shown to withstand the following loads:

- 1) The handle must remain latched under the side load condition.
Demonstrated in Test Report TR362.02, Revision 2, section 7.6
- 2) The lid must restrain the cargo under the upward load condition.
Demonstrated in Test Report TR362.02, Revision 2, section 7.3
- 3) The forward end must restrain the cargo under the forward load condition.
Demonstrated in Test Report TR362.02, Revision 2, section 7.4
- 4) The basket must withstand the combined maneuvering and drag conditions.
Demonstrated in Test Report TR606.05, Revision 0.

6.2 Basket Attachment

The basket is attached to the beams with two mounting plates per beam. The plates are attached to the basket with lugs installed in the bottom of 2 hoops that form the basket, using AN3 bolts. The plates are attached to the beams with two AN4 bolts.

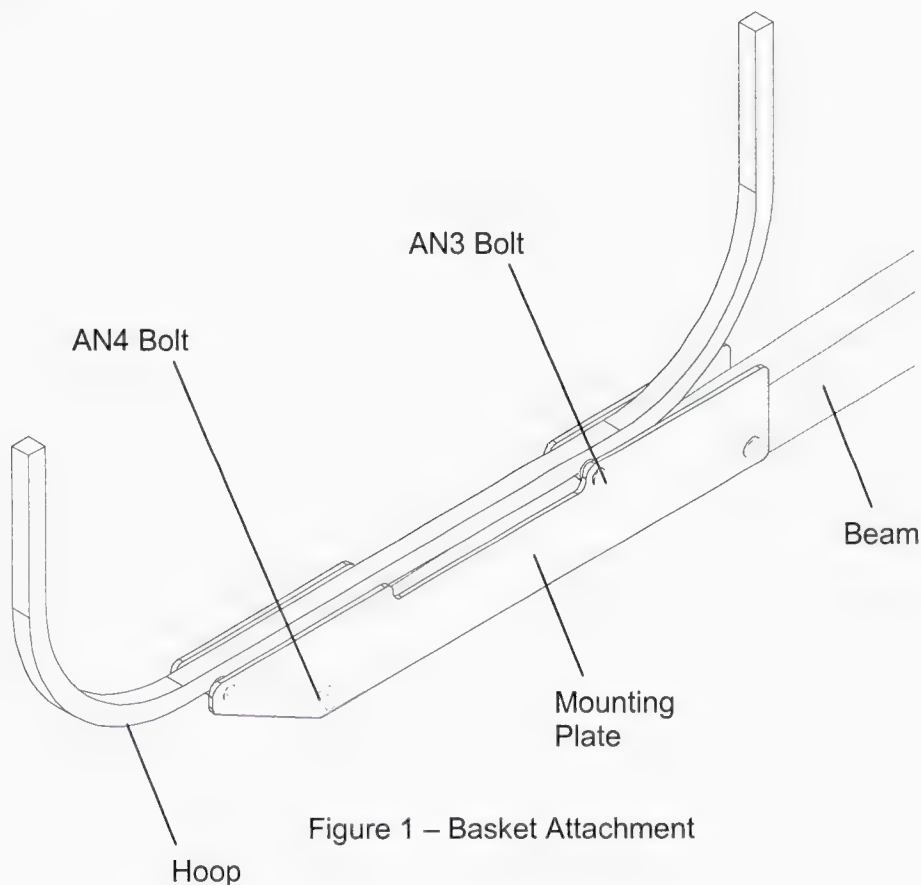


Figure 1 – Basket Attachment

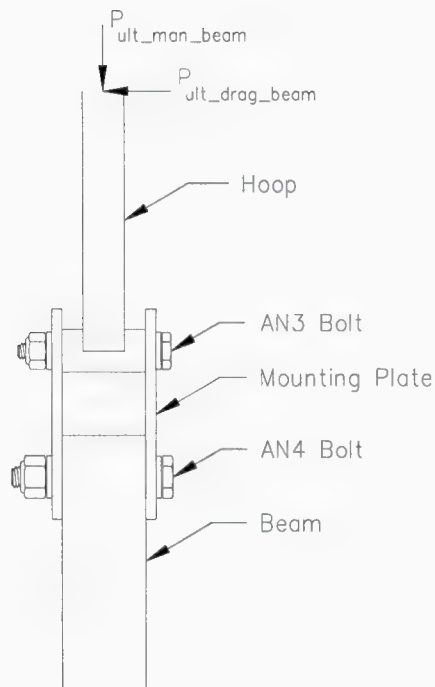


Figure 2 – Looking Inboard at Forward Basket Attachment

Structural compliance of the basket attachments has been shown by test. Refer to TR606.05.

The basket was loaded with 1500 lb. of lead shot to simulate the maneuvering load (1365 lb. required, reference section 5.0), and a drag load of 630 lb. applied (451 lb. total required, reference section 5.0). The basket was only attached with the mounting plates to a beam on the forward end. The aft attachment was resting on blocks, so it could not support any drag load.

The forward load would be carried equally by both beams, so the forward load would apply 520 lb. (1040 lb / 2) to each beam. This condition was demonstrated in the test by the drag load.

6.3 Beams

The basket is mounted further outboard than on any previous installation, so the beams must be able to withstand the increased bending moment. The basket must not block the pilot's door.

Basic Loads

Drag $V_d := 518\text{ lbf}$	Ultimate drag on basket at V_d
$W_{\text{cargo}} := 200\text{ lbf}$	Weight of cargo
$W_{\text{basket}} := 60\text{ lbf}$	Weight of basket assembly
$W_{\text{beam}} := 7.9\text{ lbf}$	Portion of beam cantilever out

$$cg_{rear_beam} := 16.4 \text{ in}$$

Dist from landing gear fitting to cg of cantilever section of rear beam

$$n_m := 3.5$$

Maneuvering load factor(Ref: FAR 27.337)

$$n_{sf} := 1.5$$

Safety Factor (Ref: FAR 27.303)

$$n_{561_fwd} := 4$$

Forward Load condition(Ref: FAR 27.561)

Rear Beam Loads

The rear beam is critical because the attachments are closer together.

$$p_{drag} := \frac{\text{Drag } V_d}{2}$$

$$p_{drag} = 259 \cdot \text{lbf}$$

Drag on rear beam

$$p_{man_ult} := \left(\frac{W_{cargo} + W_{basket}}{2} \right) \cdot n_m \cdot n_{sf}$$

$$p_{man_ult} = 682.5 \cdot \text{lbf}$$

Ultimate maneuvering load on rear beam

$$p_{561_fwd} := \left(\frac{W_{cargo} + W_{basket}}{2} \right) \cdot n_{561_fwd}$$

$$p_{561_fwd} = 520 \cdot \text{lbf}$$

Ultimate forward load on rear beam

Bending Moments

$$l := 36.5 \text{ in}$$

Distance from landing gear attachment to mid-basket

$$M_{drag} := p_{drag} \cdot l$$

Ultimate bending moment due to drag

$$M_{drag} = 9454 \cdot \text{lbf} \cdot \text{in}$$

Where:

$$p_{drag} = 259 \cdot \text{lbf}$$

$$M_{man_ult} := p_{man_ult} \cdot l + W_{beam} \cdot cg_{rear_beam} \cdot n_m \cdot n_{sf}$$

$$M_{man_ult} = 25591 \cdot \text{lbf} \cdot \text{in}$$

Ultimate bending moment due to maneuvering load

Where:

$$p_{man_ult} = 682.5 \cdot \text{lbf}$$

$$M_{561_fwd} := p_{561_fwd} \cdot l + W_{beam} \cdot cg_{rear_beam} \cdot n_{561_fwd}$$

$$M_{561_fwd} = 19498 \cdot \text{lbf} \cdot \text{in}$$

Ultimate bending moment due to forward load

Where:

$$p_{561_fwd} = 520 \cdot \text{lbf}$$

Section Properties

$$y := 3 \cdot \text{in}$$

Height of section

$$x := 1 \cdot \text{in}$$

Width of section

$$I_{yy} := \frac{1}{12} \cdot x^3 \cdot y$$

$$I_{yy} = 0.25 \cdot \text{in}^4$$

Moment of inertia about y axis

$$I_{xx} := \frac{1}{12} \cdot x \cdot y^3$$

$$I_{xx} = 2.25 \cdot \text{in}^4$$

Moment of inertia about x axis

Bending Stress

$$f_{b_Drag} := \frac{M_{drag} \cdot \frac{x}{2}}{I_{yy}}$$

$$f_{b_Drag} = 18.9 \cdot \text{ksi}$$

Ultimate bending stress due to drag

$$f_{man_ult} := \frac{M_{man_ult} \cdot \frac{y}{2}}{I_{xx}}$$

$$f_{man_ult} = 17.1 \cdot \text{ksi}$$

Ultimate bending stress due to maneuvering load

$$f_{b_comb_ult} := f_{b_Drag} + f_{man_ult}$$

$$f_{b_comb_ult} = 36 \cdot \text{ksi}$$

Ultimate combined bending stress

$$f_{b_comb_lim} := \frac{f_{b_comb_ult}}{n_{sf}}$$

$$f_{b_comb_lim} = 24 \cdot \text{ksi}$$

Limit combined stress

$$F_{ty} := 35 \cdot \text{ksi}$$

Yield tensile strength of extruded 6061-T6 bar (Ref: MIL-HDBK-5J)

$$F_{tu} := 38 \cdot \text{ksi}$$

Ultimate tensile strength of extruded 6061-T6 bar (Ref: MIL-HDBK-5J)

$$\text{Limit Margin of Safety } MS := \frac{F_{ty}}{f_{b_comb_lim}} - 1$$

$$MS = 0.46$$

$$\text{Ultimate Margin of Safety } MS := \frac{F_{tu}}{f_{b_comb_ult}} - 1$$

$$MS = 0.056$$

$$f_{561_fwd} = \frac{M_{561_fwd} \cdot \frac{x}{2}}{I_{yy}}$$

$$f_{561_fwd} = 39 \text{ ksi}$$

Ultimate bending stress due to forward load

$$\text{Margin of Safety} \quad MS := \frac{F_{ty}}{f_{561_fwd}} - 1$$

$$MS = -0.102$$

The yield stress is used for the margin of safety in the forward direction because the beams must not permanently deflect to the point where the pilot's door would be blocked. The margins of safety are conservative because they do not consider the bending modulus of rupture, which would increase the allowable stress.

The following conditions must be satisfied for the beams to be acceptable:

- Requirements of FAR 27.305(a) - The beams must not be permanently deformed by the combined limit drag and limit maneuvering loads.

This is shown in the analysis above.

- Requirements of FAR 27.305(b) - The beams must not fail when the combined ultimate drag and ultimate maneuvering load are applied.

This is also shown by the analysis above.

- Requirements of FAR 27.787(c) - The beams must not be permanently deflected forward enough to block the pilot's door.

Since the forward condition has a negative margin of safety a rear beam was tested to ensure the pilot's door will not be blocked after ultimate forward load has been applied. Refer to test report TR606.04. The beam was permanently deflected 0.25 inch after 570 lb was applied, and 1.13 inches after 670 lb was applied. The maximum allowable deflection is 1.25 inches, as any further would block the pilot's door.

The test shows that the basket will not block the pilot's door after the forward load condition has been experienced.

6.4 Attachment Fittings

The aft fittings are critical because they are closer together than the forward fittings.

Basic reactions on the fittings:

Maneuvering condition

$$P_{ult_man_beam} := \frac{W_{basket} + W_{cargo}}{2} \cdot n_{man_ult} \cdot n_{ff}$$

Ultimate maneuvering load on beam

$$P_{ult_man_beam} = 785 \cdot \text{lbf}$$

Summing moments about A = 0 :

$$R_{B_vert} := \frac{P_{ult_man_beam} \cdot 36.5 \text{ in}}{20.5 \text{ in}}$$

Vertical reaction on B

$$R_{B_vert} = 1397 \cdot \text{lbf}$$

Summing forces vertically:

$$R_{A_vert} := P_{ult_man_beam} + R_{B_vert}$$

Vertical reaction on A

$$R_{A_vert} = 2182 \cdot \text{lbf}$$

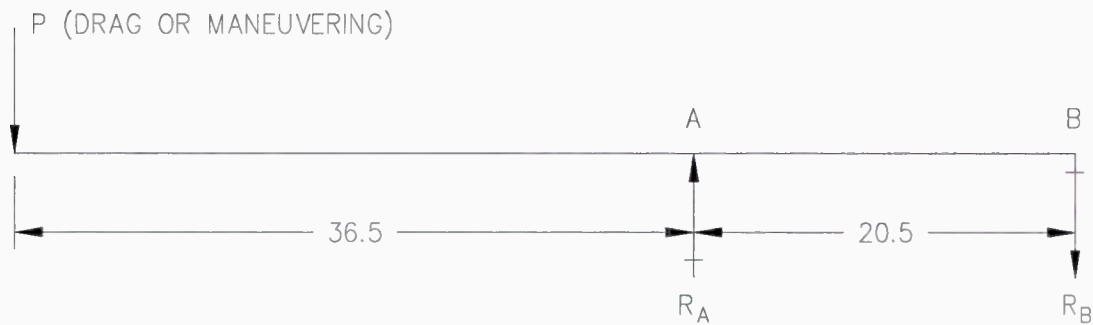


Figure 3 – Free Body Diagram of Loads on Aft Attachments (Drag or Maneuvering)

Drag condition

Ultimate drag on basket

$$P_{drag_ult} = 518 \cdot \text{lbf}$$

$$P_{ult_drag_beam} := \frac{P_{drag_ult}}{2}$$

Ultimate drag on each beam

$$P_{ult_drag_beam} = 259 \cdot \text{lbf}$$

Summing moments about A = 0 :

$$R_{B_horiz} := \frac{P_{ult_drag_beam} \cdot 36.5 \text{ in}}{20.5 \text{ in}}$$

Horizontal reaction on B

$$R_{B_horiz} = 462 \cdot \text{lbf}$$

Summing forces horizontally:

$$R_{A_horiz} := P_{ult_drag_beam} + R_{B_horiz} \quad \text{Horizontal reaction on A} \quad R_{A_horiz} = 721 \cdot \text{lbf}$$

Reactions at A are critical

$$\text{Vertical reaction on A} \quad R_{A_vert} = 2182 \cdot \text{lbf}$$

$$\text{Horizontal reaction on A} \quad R_{A_horiz} = 721 \cdot \text{lbf}$$

Using the limitations specified in Appendix A of ER493.01:

$$\text{Ultimate allowable vertical load on attachment} \quad P_{ult_vert} := 3413 \cdot \text{lbf}$$

$$\text{Ultimate fore/aft load on attachment} \quad P_{ult_fwd_aft} := 2600 \cdot \text{lbf}$$

This installation is within the limits specified.

MARGIN OF SAFETY IS POSITIVE

7.0 COMPLIANCE WITH FAR 27.807 – EMERGENCY EXITS

FAR 27.807(b)(1) states that an emergency exit must allow a 19 inch by 26 inch ellipse to pass un-obstructed. See figure 4.

Installation drawing 60603 requires either an approved emergency “pop-out” window in the passenger door or an approved sliding passenger door.

The cargo basket is position laterally to provide clearance for the sliding door to open – 6.0 inches outboard of the widest point of the helicopter on the Bell 407. This distance provides significant clearance with the “pop-out” windows. See figure 5.

Clearance from the pilot's door has been demonstrated in section 6.3 after application of ultimate forward emergency landing load factors to the basket installation.

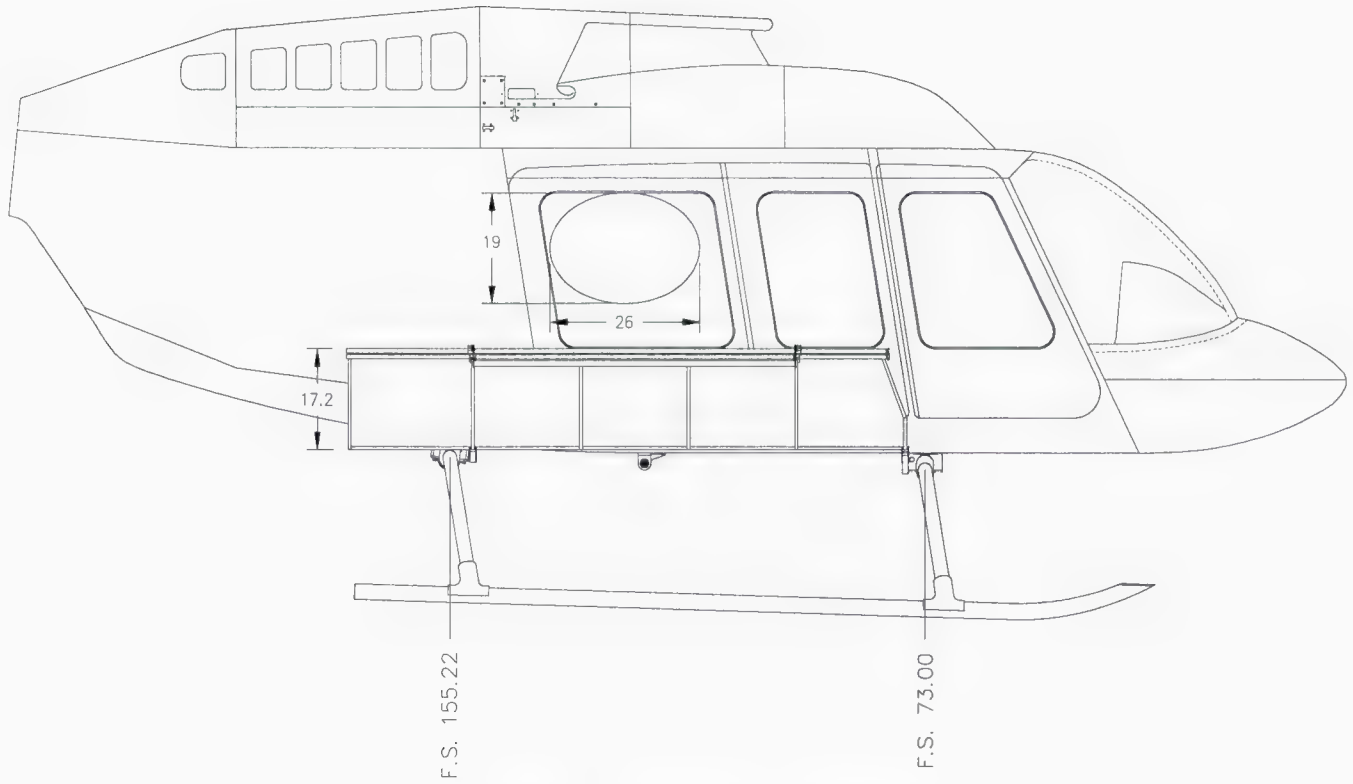


Figure 4 – Side View of Installation

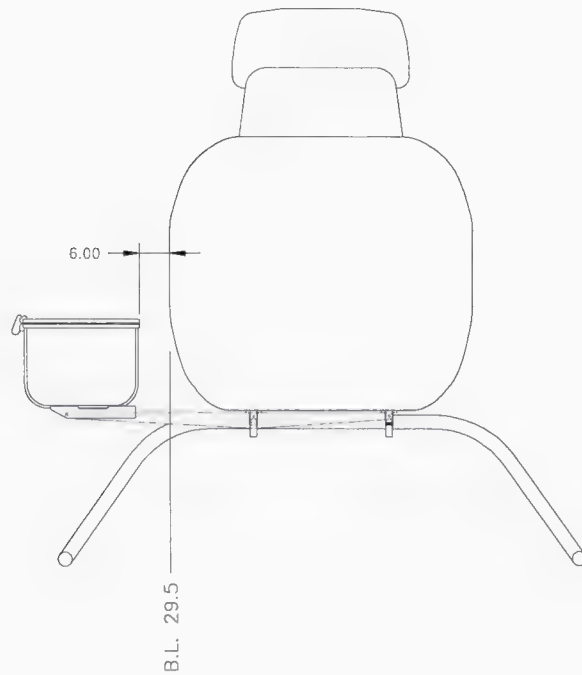


Figure 5 – Front View of Installation

APPENDIX A

EMAIL FROM TRANSPORT CANADA

From: Staal, Jack
Sent: Friday, November 19, 2004 3:28 PM
To: "Aerodesign (E-Mail)" <aerodesign@telusplanet.net>
Subject: FW: 407 Heli-Ski Basket changes

Ted,

4g forward would be accepted in this case..

Thanks

J.H. (Jack) Staal

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AERO Design Ltd.

**TEST REPORT
TR606.04**

SIDE MOUNTED CARGO BASKET

Bell 206L Series and 407

Approved: E. Burgoin, P. Eng.

Prepared by: Jeff Clarke

Revision 0

Date: 18 January, 2005

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1.0 INTRODUCTION

This report is to document testing of a beam used in the cargo basket installation. The basket is mounted farther outboard than in any previous configurations, and analysis of the beams showed a negative margin of safety, so testing is used to verify that the beam is capable of supporting the required loads.

In past analysis and testing of the cargo basket, the forward load has been 8g, in accordance with FAR 27.561(c) at amendment 27-30. Transport Canada has advised that this is incorrect. The forward load to be used is 4g, as confirmed by email from Transport Canada (see appendix A)

2.0 REFERENCE

AERO Design Ltd. Engineering Report ER 606.03

3.0 LOADS

The loads were determined in ER606.03

Basic Loads

$\text{Drag}_{V_d} := 518 \text{ lbf}$	Ultimate drag on basket at V_d
$W_{\text{cargo}} := 200 \text{ lbf}$	Weight of cargo
$W_{\text{basket}} := 60 \text{ lbf}$	Weight of basket assembly
$W_{\text{beam}} := 7.9 \text{ lbf}$	Portion of beam cantilever out
$\text{cg}_{\text{rear_beam}} := 16.4 \text{ in}$	Dist from landing gear fitting to cg of cantilever section of rear beam
$n_m := 3.5$	Maneuvering load factor (Ref: FAR 27.337)
$n_{sf} := 1.5$	Safety Factor (Ref: FAR 27.303)
$n_{561_fwd} := 4$	Forward Load condition (Ref: FAR 27.561)

Rear Beam Loads

The rear beam is critical because the attachments are closer together.

$$P_{\text{drag}} = \frac{\text{Drag}_{V_d}}{2}$$

$$P_{\text{drag}} = 259 \text{ lbf} \quad \text{Drag on rear beam}$$

$$P_{man_ult} := \left(\frac{W_{cargo} + W_{basket}}{2} \right) \cdot n_m \cdot n_{sf}$$

$$P_{man_ult} = 682.5 \cdot \text{lbf}$$

Ultimate maneuvering load on rear beam

$$P_{561_fwd} := \left(\frac{W_{cargo} + W_{basket}}{2} \right) \cdot n_{561_fwd}$$

$$P_{561_fwd} = 520 \cdot \text{lbf}$$

Ultimate forward load on rear beam

Bending Moments

$$l := 36.5 \cdot \text{in}$$

Distance from landing gear attachment to mid-basket

$$M_{drag} := P_{drag} \cdot l$$

Ultimate bending moment due to drag

$$M_{drag} = 9454 \cdot \text{lbf} \cdot \text{in}$$

Where:

$$P_{drag} = 259 \cdot \text{lbf}$$

$$M_{man_ult} := P_{man_ult} \cdot l + W_{beam} \cdot cg_{rear_beam} \cdot n_m \cdot n_{sf}$$

$$M_{man_ult} = 25591 \cdot \text{lbf} \cdot \text{in}$$

Ultimate bending moment due to maneuvering load

Where:

$$P_{man_ult} = 682.5 \cdot \text{lbf}$$

$$M_{561_fwd} := P_{561_fwd} \cdot l + W_{beam} \cdot cg_{rear_beam} \cdot n_{561_fwd}$$

$$M_{561_fwd} = 19498 \cdot \text{lbf} \cdot \text{in}$$

Ultimate bending moment due to forward load

Where:

$$P_{561_fwd} = 520 \cdot \text{lbf}$$

Section Properties

$$y := 3 \cdot \text{in}$$

Height of section

$$x := 1 \cdot \text{in}$$

Width of section

$$I_{yy} := \frac{1}{12} \cdot x^3 \cdot y$$

$$I_{yy} = 0.25 \cdot \text{in}^4$$

Moment of inertia about y axis

$$I_{xx} := \frac{1}{12} \cdot x \cdot y^3$$

$$I_{xx} = 2.25 \cdot \text{in}^4$$

Moment of inertia about x axis

Bending Stress

$$f_{b_Drag} := \frac{M_{drag} \cdot \frac{x}{2}}{I_{yy}}$$

$$f_{b_Drag} = 18.9 \cdot \text{ksi}$$

Ultimate bending stress due to drag

$$f_{man_ult} := \frac{M_{man_ult} \cdot \frac{y}{2}}{I_{xx}}$$

$$f_{man_ult} = 17.1 \cdot \text{ksi}$$

Ultimate bending stress due to maneuvering load

$$f_{b_comb_ult} := f_{b_Drag} + f_{man_ult}$$

$$f_{b_comb_ult} = 36 \cdot \text{ksi}$$

Ultimate combined bending stress

$$f_{b_comb_lim} := \frac{f_{b_comb_ult}}{n_{sf}}$$

$$f_{b_comb_lim} = 24 \cdot \text{ksi}$$

Limit combined stress

$$F_{ty} := 35 \cdot \text{ksi}$$

Yield tensile strength of extruded 6061-T6 bar (Ref: MIL-HDBK-5J)

$$F_{tu} := 38 \cdot \text{ksi}$$

Ultimate tensile strength of extruded 6061-T6 bar (Ref: MIL-HDBK-5J)

$$\text{Limit Margin of Safety } MS := \frac{F_{ty}}{f_{b_comb_lim}} - 1$$

$$MS = 0.46$$

$$\text{Ultimate Margin of Safety } MS := \frac{F_{tu}}{f_{b_comb_ult}} - 1$$

$$MS = 0.056$$

$$f_{561_fwd} := \frac{M_{561_fwd} \cdot \frac{x}{2}}{I_{yy}}$$

$$f_{561_fwd} = 39 \cdot \text{ksi}$$

Ultimate bending stress due to forward load

$$\text{Margin of Safety } MS := \frac{F_{ty}}{f_{561_fwd}} - 1$$

$$MS = -0.102$$

The yield stress is used for the forward load condition margin of safety because the beams must not deflect to the point where the pilot's door would be blocked. The

margins of safety are conservative because they do not consider the bending modulus of rupture, which would increase the allowable stress.

The purpose for this test is to confirm that there is no permanent deflection of the beam past 1.25", as this would block the pilot's door.

4.0 TEST PROCEDURE

The test was setup with a rear beam clamped to a large I beam, with the end cantilever out. The load was applied with bags of lead shot stacked on a board (supported by angles attached to the beam), with the load located at the same distance from the attachment point as the cargo basket.

The bags of lead shot weigh 25 lb. each, and the board weighs 21 lb. The beam material is 6061-T6 aluminum.

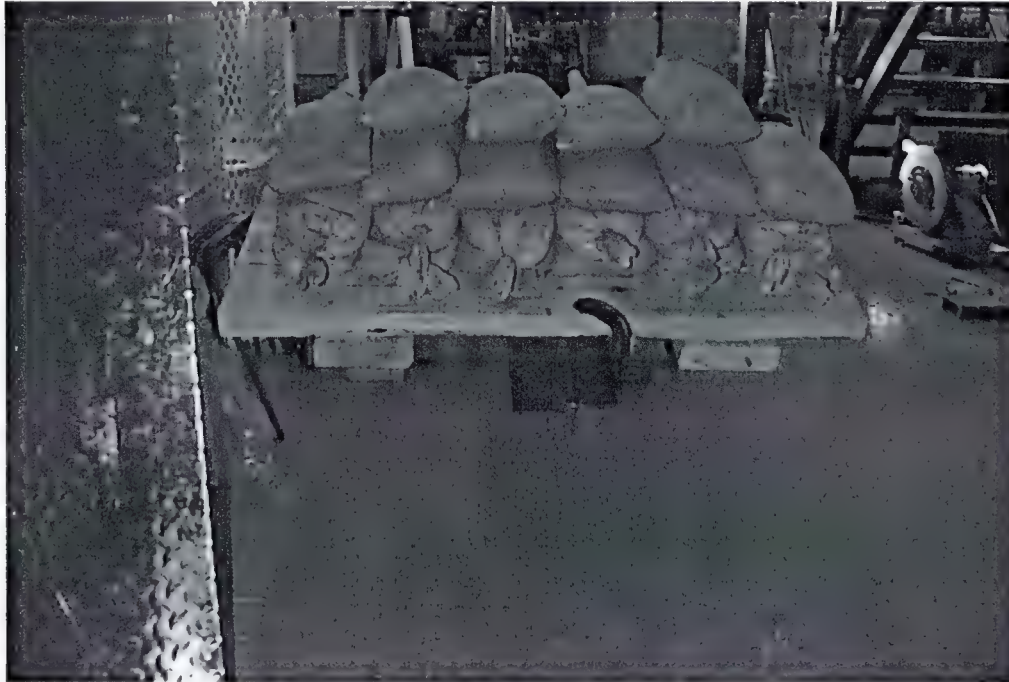
The beam was confirmed to be straight prior to testing. The height from the floor to the end of the support angles was measured with the board on the beam prior to loading the bags of lead shot. The load was applied, with the deflection under load checked periodically.

5.0 TEST

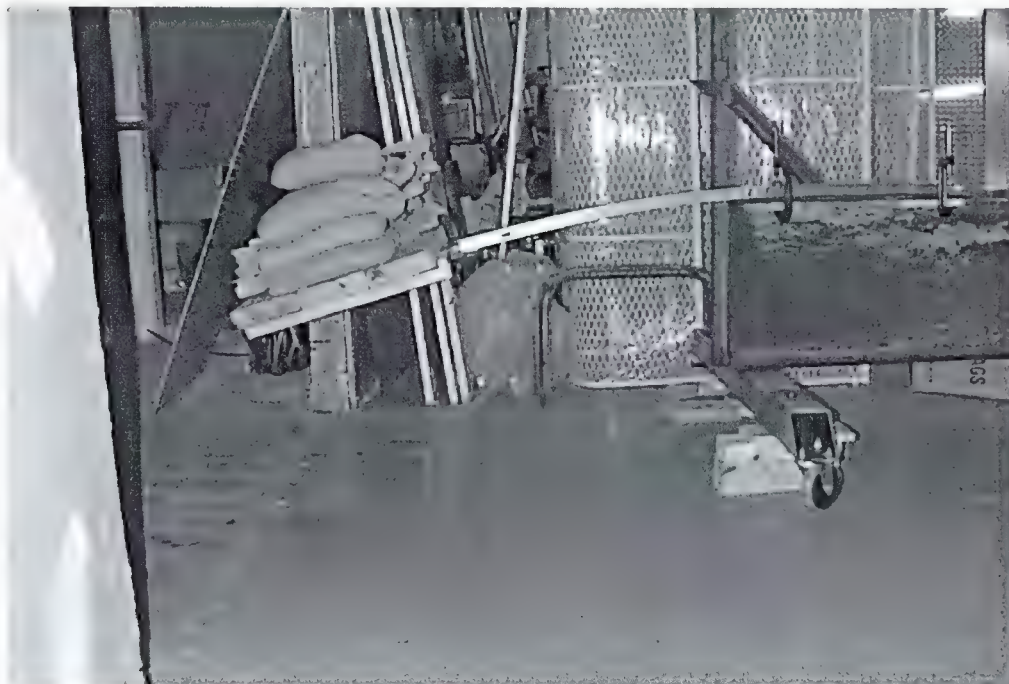
The beam was loaded with 550 lb of lead shot, then the shot was removed and the deflection checked. The beam was then loaded to 650 lb of lead shot, and the deflection checked again.

Load	Height	
0	25"	
100	23.63"	
200	21.88"	
300	20.25"	
400	18.5"	
450	17.5"	
550	15.5"	
0	24.75"	- 0.25" permanent deflection
600	14.25"	
650	12.88"	
0	23.88"	- 1.13" permanent deflection

Note: The above load does not include the weight of the board (21 lb.).



Picture 1 – 550 lb. Lead Shot



Picture 2 – 550 lb. Lead Shot (side view)



Picture 3 – 650 lb. Lead Shot

6.0 CONCLUSIONS

The permanent deflections noted above are not at the end of the beam, but at a point further past the end of the beam (at the end of the support angles). Using these deflections is conservative.

When in service, the beam would not deflect as a simple cantilever. The basket and mounting plates would provide some restraint to the deflection of the beam. The test performed is conservative.

The beam used in the test has additional holes drilled across the section (for a different mounting) adjacent to the point where the beam was cantilever out. This would serve to reduce the overall strength of the beam at that section.

The results of the test show that if the ultimate strength of the beam is 670 lb., with an ultimate bending moment at the attachment point of 24455 in-lb. (670 lb. x 36.5 in), the deflection will be less than 1.25". The cargo basket will not interfere with the pilot's door after the emergency forward landing condition has occurred.

APPENDIX A

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To: "Aerodesign (E-Mail)" <aerodesign@telusplanet.net>
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AERO Design Ltd.

**TEST REPORT
TR606.05**

SIDE MOUNTED CARGO BASKET

Bell 206L Series and 407

Approved: E. Burgoin, P. Eng.

Prepared by: Jeff Clarke

Revision 0
Date: 18 January, 2005

AERO Design Ltd.
Engineering Consultants

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1.0 INTRODUCTION

This report is to document load testing of the high side mounted cargo basket assembly.

2.0 REFERENCE

AERO Design Ltd. Engineering Report ER606.03

3.0 LOADS

This load test is to demonstrate that the basket and mounting plates are sufficient in the combined drag and maneuvering load conditions, and in the emergency forward load condition. The beams have been demonstrated to be sufficient in TR606.04.

LOADS ON BASKET

Weight of basket.	$W_{\text{basket}} := 60 \text{ lbf}$
Cargo Capacity of basket.	$W_{\text{cargo}} := 200 \text{ lbf}$
Fitting Factor (Not required where compliance is shown by test)	$n_{\text{ff}} = 1.15$

DOWNWARD:

The basket shall support its contents under the maximum maneuvering load factor.

Ultimate Positive Maneuvering Load Factor:	$n_{\text{man_ult}} = 5.25$
$P_{z_ult} := (W_{\text{basket}} + W_{\text{cargo}}) \cdot n_{\text{man_ult}}$	Ultimate Vertical Load on basket. $P_{z_ult} = 1365 \text{ lbf}$
$P_{z_ult_test} := W_{\text{basket}} \cdot (n_{\text{man_ult}} - 1) + W_{\text{cargo}} \cdot n_{\text{man_ult}}$	
Ultimate downward load required for test (Weight of basket already acting down)	$P_{z_ult_test} = 1305 \text{ lbf}$

FORWARD:

Deflection of the basket, or shifting of its contents in the forward direction in an emergency landing does not endanger the occupants of the helicopter. However, forward deflection of the basket could block the pilot's door, so the forward load is required.

Ultimate Forward Emergency Load Factor:	$n_{\text{e_fwd}} = 4.00$
$P_{\text{fwd_ult}} := (W_{\text{basket}} + W_{\text{cargo}}) \cdot n_{\text{e_fwd}}$	Ultimate forward load on basket $P_{\text{fwd_ult}} = 1040 \text{ lbf}$

The forward load is evenly distributed between the forward and aft attachments.

$$P_{\text{fwd_beam_test}} := \frac{P_{\text{fwd_ult}}}{2} \quad \text{Ultimate forward load on each beam} \quad P_{\text{fwd_beam_test}} = 520 \cdot \text{lbf}$$

DRAG LOAD ON BASKET

	Length of basket.	$l_{\text{basket}} := 96.5 \cdot \text{in}$
	Width of basket.	$w_{\text{basket}} := 22 \cdot \text{in}$
	Height of basket.	$h_{\text{basket}} := 17 \cdot \text{in}$
	Frontal Area of basket.	$A_f := 352 \cdot \text{in}^2$
$A_p := l_{\text{basket}} \cdot w_{\text{basket}}$	Planar Area of basket.	$A_p = 2123 \cdot \text{in}^2$
	Fineness ratio of basket	$\frac{l_{\text{basket}}}{w_{\text{basket}}} = 4.4$
	Drag Coefficient of Basket, (overestimated) (Ref. Hoerner, Fluid Dynamic Drag, Chapter 3, Figure 22).	$C_{D0} := 1.5$
	Density of air at Sea Level.	$\rho := 0.002378 \frac{\text{slug}}{\text{ft}^3}$
	Never-Exceed-Speed of 407. (Ref. 407 Flight Manual.)	$V_{\text{ne}} := 140 \cdot \text{knots}$
$V_d := \frac{V_{\text{ne}}}{0.9}$	Dive Speed of Bell 407	$V_d = 156 \cdot \text{knots}$
$\text{Drag} := \frac{\rho}{2} \cdot V_d^2 \cdot A_f \cdot C_{D0}$	Drag on basket.	$\text{Drag} = 301 \cdot \text{lbf}$
$P_{\text{drag_ult_test}} := \text{Drag} \cdot n_{\text{sf}}$	Ultimate applied Drag load on basket if compliance shown by test	$P_{\text{drag_ult_test}} = 451 \cdot \text{lbf}$

The drag load is evenly distributed between the forward and aft attachments.

$$P_{\text{drag_beam_test}} := \frac{P_{\text{drag_ult_test}}}{2} \quad \text{Ultimate drag load on each beam} \quad P_{\text{drag_beam_test}} = 225 \cdot \text{lbf}$$

4.0 SETUP

The forward attachments of the cargo basket were attached to the mounting plates, and the mounting plates attached to a beam. As this test was not to demonstrate the beam, it was clamped to the table and blocked to prevent rotation. The rear attachment was set on blocks (so it could not support any fore/aft loads).

The down load was applied by stacking bags of lead shot, 25 lb. each, inside the basket, evenly distributed over the entire bottom of the basket. The drag load was applied by attaching a chain around the forward end of the basket and pulling aft with a come-along attached to a load cell. The set up for drag is also used to demonstrate the forward load.

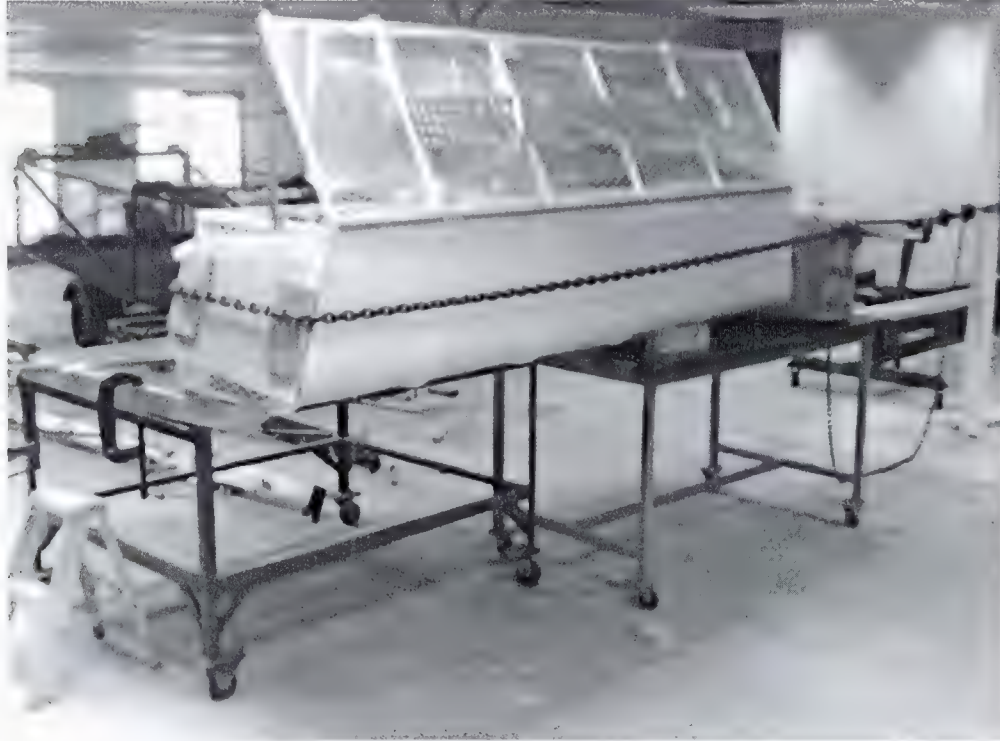


Figure 1 – Test Setup

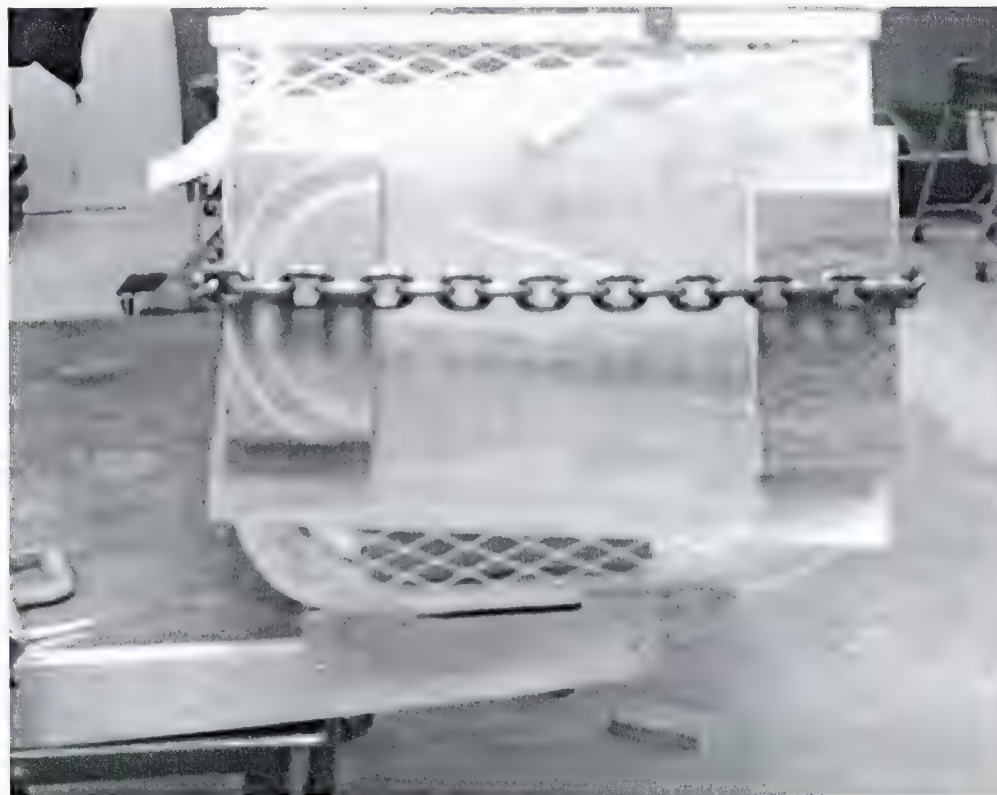


Figure 2 – Test Setup (Forward End)



Figure 3 – Blocks Under Aft Attachment

5.0 TEST

The basket was loaded with 1500 lb. of lead shot. (1305 lb. required).

The chain was pulled to read 630 lb. on the load cell (225 lb. required for drag condition, 520 lb. required for forward condition).

The basket assembly and mounting plates did not fail and showed no signs of permanent deformation after the load was removed.



Figure 4 – Basket Loaded with Lead



Figure 3 – Applied Drag/Forward Load

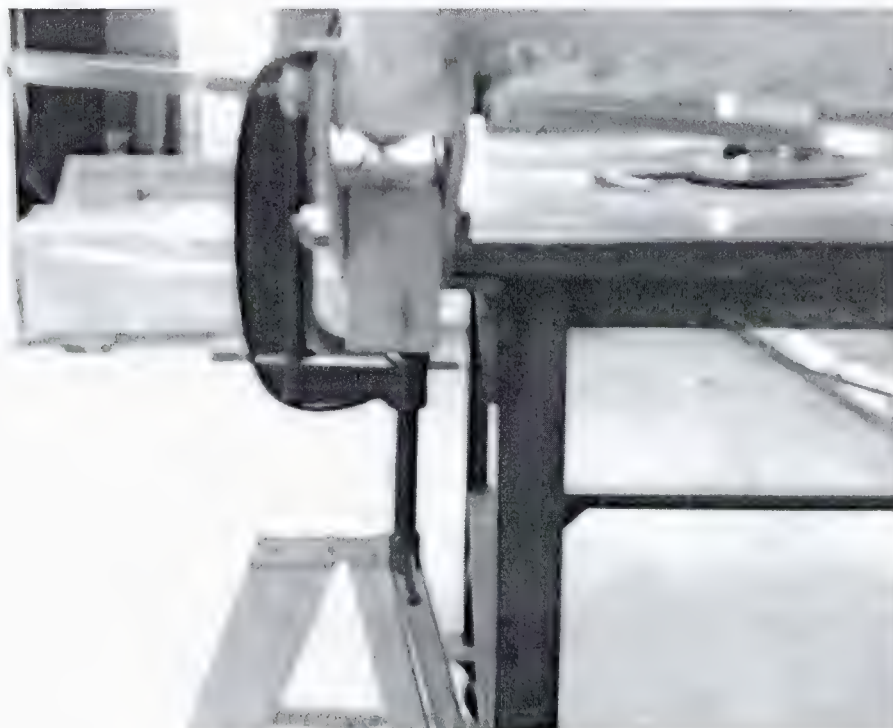


Figure 4 – Mounting Plates

200 lb in basket

Pilot only

CENTRE OF GRAVITY	LONGITUDINAL			LATERAL	
	WEIGHT (LB.)	ARM (IN.)	MOMENT (LB.-IN.)	ARM (IN.)	MOMENT (LB.-IN.)
EMPTY WEIGHT	2,994	131.3	393,142	0.3	868.3
PILOT	180	65.0	11,700	14.0	2,520.0
PASSENGERS					0.0
FRONT LEFT	0	65.0	0	(11.1)	0.0
AFT FACING LEFT	0	91.0	0	(13.0)	
AFT FACING RIGHT	0	91.0	0	15.5	
REAR LEFT	0	129.0	0	(16.8)	0.0
REAR CENTRE	0	129.0	0	0.0	0.0
REAR RIGHT	0	129.0	0	16.8	0.0
OIL	13	205.0	2,665	0.0	0.0
BAGGAGE COMPARTMENT	0	174.0	0	0.0	0.0
CARGO BASKET					
Rear Arm	10	151.3	1,513	17.5	175.0
Fwd Arm	10	76.4	764	18.2	182.0
Basket	50	124.4	6,220	46.2	2,310.0
Cargo (Loaded in centre of basket)	200	124.4	24,880	46.2	9,240.0
TAKE-OFF GROSS WEIGHT	<hr/>				
Gross Weight @ zero fuel	3,457	127.5	440,884	4.4	15,295.3
Aux Fuel Tank Fuel	0	159.5	0	0.0	0.0
FULL FUEL					
Gross Weight @ zero fuel	3,457	127.5	440,884	4.4	15,295.3
Full Fuel (JP-5)	869	127.0	<u>110,363</u>	0.0	<u>0.0</u>
Take-off Gross Weight	4,326	127.4	551,247	3.5	15,295.3
MOST AFT CG CONDITION					
Gross Weight @ zero fuel	3,457	127.5	440,884	4.4	15,295.3
Fuel for Crit. Aft CG	193	137.0	<u>26,441</u>	0.0	<u>0.0</u>
	3,650	128.0	467,325	4.2	15,295.3
MOST FWD CG CONDITION					
Gross Weight @ zero fuel	3,457	127.5	440,884	4.4	15,295.3
Fuel for Crit. Aft CG	344	115.7	<u>39,801</u>	0.0	<u>0.0</u>
	3,801	126.5	480,685	4.0	15,295.3

↑
all aft of limit

CENTRE OF GRAVITY	407 C of G LONGITUDINAL			LATERAL	
	WEIGHT (LB.)	ARM (IN.)	MOMENT (LB.-IN.)	ARM (IN.)	MOMENT (LB.-IN.)
EMPTY WEIGHT	2,994	131.3	393,142	0.3	868.3
PILOT	180	65.0	11,700	14.0	2,520.0
PASSENGERS					0.0
FRONT LEFT	0	65.0	0	(11.1)	0.0
AFT FACING LEFT	0	91.0	0	(13.0)	
AFT FACING RIGHT	0	91.0	0	15.5	
REAR LEFT	0	129.0	0	(16.8)	0.0
REAR CENTRE	0	129.0	0	0.0	0.0
REAR RIGHT	0	129.0	0	16.8	0.0
OIL	13	205.0	2,665	0.0	0.0
BAGGAGE COMPARTMENT	0	174.0	0	0.0	0.0
CARGO BASKET					
Rear Arm	10	151.3	1,513	17.5	175.0
Fwd Arm	10	76.4	764	18.2	182.0
Basket	50	124.4	6,220	46.2	2,310.0
Cargo (Loaded in centre of basket)	100	124.4	12,440	46.2	4,620.0
<hr/>					
TAKE-OFF GROSS WEIGHT					
Gross Weight @ zero fuel	3,357	127.6	428,444	3.2	10,675.3
Aux Fuel Tank Fuel	0	159.5	0	0.0	0.0
FULL FUEL					
Gross Weight @ zero fuel	3,357	127.6	428,444	3.2	10,675.3
Full Fuel (JP-5)	869	127.0	<u>110,363</u>	0.0	<u>0.0</u>
Take-off Gross Weight	4,226	127.5	538,807	2.5	10,675.3
				at limit	
MOST AFT CG CONDITION					
Gross Weight @ zero fuel	3,357	127.6	428,444	3.2	10,675.3
Fuel for Crit. Aft CG	193	137.0	<u>26,441</u>	0.0	<u>0.0</u>
	3,550	128.1	454,885	3.0	10,675.3
				at limit	
MOST FWD CG CONDITION					
Gross Weight @ zero fuel	3,357	127.6	428,444	3.2	10,675.3
Fuel for Crit. Aft CG	344	115.7	<u>39,801</u>	0.0	<u>0.0</u>
	3,701	126.5	468,245	2.9	10,675.3
				at limit	

100 lb in basket

Pilot only

all 100 lbs over aft beam, CG remains in limits

FULL BASKET
PAY TO MAX GW

CENTRE OF GRAVITY

	WEIGHT (LB.)	LONGITUDINAL ARM (IN.)	MOMENT (LB.-IN.)	LATERAL ARM (IN.)	MOMENT (LB.-IN.)
EMPTY WEIGHT	2,994	131.3	393,142	0.3	868.3
PILOT	180	65.0	11,700	14.0	2,520.0
PASSENGERS					0.0
FRONT LEFT	180	65.0	11,700	(11.1)	(1,998.0)
AFT FACING LEFT	180	91.0	16,380	(13.0)	
AFT FACING RIGHT	0	91.0	0	15.5	
REAR LEFT	180	129.0	23,220	(16.8)	(3,024.0)
REAR CENTRE	180	129.0	23,220	0.0	0.0
REAR RIGHT	0	129.0	0	16.8	0.0
OIL	13	205.0	2,665	0.0	0.0
BAGGAGE COMPARTMENT	0	174.0	0	0.0	0.0
CARGO BASKET					
Rear Arm	10	151.3	1,513	17.5	175.0
Fwd Arm	10	76.4	764	18.2	182.0
Basket	50	124.4	6,220	46.2	2,310.0
Cargo (Loaded in centre of basket)	200	124.4	24,880	46.2	9,240.0

TAKE-OFF GROSS WEIGHT

Gross Weight @ zero fuel	4,177	123.4	515,404	2.5	10,273.3
Aux Fuel Tank Fuel	0	159.5	0	0.0	0.0

FULL FUEL

Gross Weight @ zero fuel	4,177	123.4	515,404	2.5	10,273.3
Full Fuel (JP-5)	869	127.0	<u>110,363</u>	0.0	<u>0.0</u>
Take-off Gross Weight	5,046	124.0	625,767	2.0	10,273.3

↳ over (slightly)

↳ under limit

MOST AFT CG CONDITION

Gross Weight @ zero fuel	4,177	123.4	515,404	2.5	10,273.3
Fuel for Crit. Aft CG	193	137.0	<u>26,441</u>	0.0	<u>0.0</u>
	4,370	124.0	541,845	2.4	10,273.3

↳ at limit

MOST FWD CG CONDITION

Gross Weight @ zero fuel	4,177	123.4	515,404	2.5	10,273.3
Fuel for Crit. Aft CG	344	115.7	<u>39,801</u>	0.0	<u>0.0</u>
	4,521	122.8	555,205	2.3	10,273.3

↳ at limit

550 -

600 -

650 -

700 -

750 -

800 -

Basic Loads

$$\text{Drag } V_d := 553 \cdot \text{lbf}$$

Total drag on basket

$$w_{\text{load}} := 200 \cdot \text{lbf}$$

$$w_{\text{basket}} := 75 \cdot \text{lbf}$$

$$w_{\text{beam}} := 7.9 \cdot \text{lbf}$$

Portion of beam cantilever out

$$cg_{\text{rear_beam}} := 7.2 \cdot \text{in}$$

Dist from skid tube clamp to cg of rear beam

$$n_m := 3.5$$

Maneuvering load factor

$$n_{sf} := 1.5$$

Safety Factor

$$n_{561_fwd} := 4$$

561 Forward Load condition

Rear Beam Loads

$$p_{\text{drag}} := \frac{\text{Drag } V_d}{2}$$

$$p_{\text{drag}} = 276.5 \cdot \text{lbf}$$

$$p_{\text{man_ult}} := \left(\frac{w_{\text{load}} + w_{\text{basket}}}{2} \right) \cdot n_m \cdot n_{sf}$$

$$p_{\text{man_ult}} = 721.875 \cdot \text{lbf}$$

$$p_{561_fwd} := \left(\frac{w_{\text{load}} + w_{\text{basket}}}{2} \right) \cdot n_{561_fwd}$$

$$p_{561_fwd} = 550 \cdot \text{lbf}$$

FIRST TEST

Bending Moments

$$l := 36.5 \cdot \text{in}$$

Rear brkt to mid-basket

$$M_{\text{drag}} := p_{\text{drag}} \cdot l$$

$$p_{\text{drag}} = 276.5 \cdot \text{lbf}$$

$$M_{\text{drag}} = 10092 \cdot \text{lbf} \cdot \text{in}$$

$$M_{\text{man_ult}} := p_{\text{man_ult}} \cdot l + w_{\text{beam}} \cdot cg_{\text{rear_beam}}$$

$$M_{\text{man_ult}} = 26405 \cdot \text{lbf} \cdot \text{in}$$

$$M_{561_fwd} := p_{561_fwd} \cdot l + w_{beam} \cdot c_{g_rear_beam}$$

$$M_{561_fwd} = 20132 \cdot \text{lb} \cdot \text{in}$$

Section Properties

$$y := 3 \cdot \text{in}$$

$$x := 1 \cdot \text{in}$$

$$I_{yy} := \frac{1}{12} \cdot x^3 \cdot y$$

$$I_{yy} = 0.25 \cdot \text{in}^4$$

$$I_{xx} := \frac{1}{12} \cdot x \cdot y^3$$

$$I_{xx} = 2.25 \cdot \text{in}^4$$

Bending Stress

$$f_{b_Drag} := \frac{M_{drag} \cdot \frac{x}{2}}{I_{yy}}$$

$$f_{b_Drag} = 20.185 \cdot \text{ksi}$$

$$f_{man_ult} := \frac{M_{man_ult} \cdot \frac{y}{2}}{I_{xx}}$$

$$f_{man_ult} = 17.604 \cdot \text{ksi}$$

$$f_{b_Drag} + f_{man_ult} = 37.788 \cdot \text{ksi}$$

$$f_{561_fwd} := \frac{M_{561_fwd} \cdot \frac{x}{2}}{I_{yy}}$$

$$f_{561_fwd} = 40.264 \cdot \text{ksi}$$

$$F_{ty} := 36 \cdot \text{ksi}$$

$$MS := \frac{F_{ty}}{f_{561_fwd}} - 1$$

$$MS = -0.106$$

deflections
~~23 3/8~~ | 0 - 25 w/ Board

● Board = 21 lb.

100 - 23 5/8

200 - 21 7/8

300 - 20 1/4

400 - 18 1/2

450 - 17 1/2

pic 1

500 -

pic 2 creaking

550 - 15 1/2

pic 3/4

0 - 24 3/4 ~ w/ Board.

600 - 14 1/4 pic 5

650 - 12 7/8 pic 6

0 - 23 7/8

Deflection

1/4" over 51 1/8 span

51 1/8
 $\theta = 0.28^\circ$

- Note: point measured
 is past end of beam

- Hole in beam weakens
 Section = conservative

Basic Loads

$$\text{Drag } V_d := 250 \cdot \text{lbf}$$

$$w_{\text{load}} := 200 \cdot \text{lbf}$$

$$w_{\text{basket}} := 30 \cdot \text{lbf}$$

$$w_{\text{beam}} := 10 \cdot \text{lbf}$$

$$cg_{\text{rear_beam}} := 10 \cdot \text{in}$$

Dist from skid tube clamp to cg of rear beam

$$n_m := 3.5$$

$$n_{sf} := 1.5$$

$$n_{561_fwd} := 4$$

Rear Beam Loads

$$p_{\text{drag}} := \frac{\text{Drag } V_d}{2}$$

$$p_{\text{drag}} = 125 \cdot \text{lbf}$$

$$p_{\text{man_ult}} := \left(\frac{w_{\text{load}} + w_{\text{basket}}}{2} \right) \cdot n_m \cdot n_{sf}$$

$$p_{\text{man_ult}} = 603.75 \cdot \text{lbf}$$

$$p_{561_fwd} := \left(\frac{w_{\text{load}} + w_{\text{basket}}}{2} \right) \cdot n_{561_fwd}$$

$$p_{561_fwd} = 460 \cdot \text{lbf}$$

Bending Moments

$$l := 32.5 \cdot \text{in}$$

Rear brkt to mid-basket

$$M_{\text{drag}} := p_{\text{drag}} \cdot l$$

$$p_{\text{drag}} = 125 \cdot \text{lbf}$$

$$M_{\text{drag}} = 4.063 \cdot 10^3 \cdot \text{lbf} \cdot \text{in}$$

THIS OVER-STATES
BENDING MOMENT DUE
TO BEAM
SHOULD BE ONLY CANTILEVER
SECTION AT ITS CENTROID.



10" GUESS.

T

32.5" 35.7" to clear sliding door.



60 HANDED

$$M_{\text{man_ult}} := P_{\text{man_ult}} \cdot l + w_{\text{beam}} \cdot c_{\text{g rear_beam}}$$

$$M_{\text{man_ult}} = 1.972 \cdot 10^4 \cdot \text{lb} \cdot \text{in}$$

$$M_{561_fwd} := P_{561_fwd} \cdot l + w_{\text{beam}} \cdot c_{\text{g rear_beam}}$$

$$M_{561_fwd} = 1.505 \cdot 10^4 \cdot \text{lb} \cdot \text{in}$$

Section Properties

$$y := 3 \cdot \text{in}$$

$$x := 1 \cdot \text{in}$$

$$I_{yy} = \frac{1}{12} \cdot x^3 \cdot y$$

$$I_{yy} = 0.25 \cdot \text{in}^4$$

$$I_{xx} = \frac{1}{12} \cdot x \cdot y^3$$

$$I_{xx} = 2.25 \cdot \text{in}^4$$

Bending Stress

$$f_{b_Drag} := \frac{M_{\text{drag}} \cdot \frac{x}{2}}{I_{yy}}$$

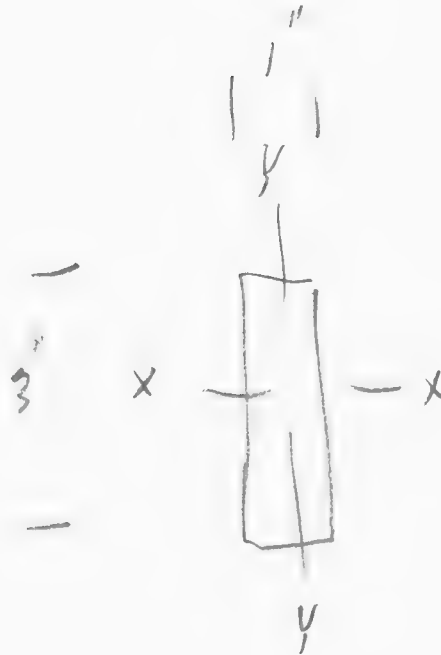
$$f_{b_Drag} = 8.125 \cdot \text{ksi}$$

$$f_{\text{man_ult}} := \frac{M_{\text{man_ult}} \cdot \frac{y}{2}}{I_{xx}}$$

$$f_{\text{man_ult}} = 13.148 \cdot \text{ksi}$$

$$f_{561_fwd} := \frac{M_{561_fwd} \cdot \frac{x}{2}}{I_{yy}}$$

$$f_{561_fwd} = 30.1 \cdot \text{ksi}$$



$$F_{ty} := 36 \cdot \text{ksi}$$

$$MS := \frac{F_{ty}}{f_{561_fwd}} - 1$$

$$MS = 0.196$$

42
10
- 3/4

1/2

AERO DESIGN LTD.

2013 – 39 Avenue N.E., Calgary, Alberta, T2E 6R7

Tel: 403-250-8027

Fax: 403-250-8333

aerodesign@telusplanet.net

9 August, 2004

Transport Canada
Aircraft Certification Division
11th Floor, Canada Place
9700 Jasper Avenue
Edmonton, Alberta
T5J 4E6

Attn: Jack Staal

Your File # : SH00-48

Our File # : 606

Re: Application for FAA Approval of Bell Heli Cargo Basket SH00-48

Jack,

Please forward the following documents to the proper FAA office for familiarization of this STC:

Supplemental Type Certificate	SH00-48	Issue 3
Application for Supplemental Type Certificate	Form 8110-12	
Compliance Program	CP606	Revision 0
Compliance Program	CP492	Revision 3
Compliance Program	CP493	Revision 2
Compliance Program	CP362-01	Revision 4
Document Control List	DCL606	Revision 1
Document Control List	DCL492	Revision 4
Document Control List	DCL493	Revision 5
Document Control List	DCL362	Revision 3
Flight Manual Supplement	FMS 606.01	Revision 0
Flight Manual Supplement	FMS 492.01	Revision 0
Flight Manual Supplement	FMS 493.01	Revision 0
Flight Manual Supplement	FMS 362.01	Revision 1
Maintenance Instructions	MI 606.01	Revision 2
Maintenance Instructions	MI 492.01	Revision 3
Maintenance Instructions	MI 493.01	Revision 2
Maintenance Instructions	MI 362.01	Revision 1
Engineering Report	ER 606.01	Revision 0
Engineering Report	ER 606.02	Revision 0
Engineering Report	ER 492.01	Revision 0
Engineering Report	ER 492.02	Revision 0
Engineering Report	ER 493.01	Revision 1
Engineering Report	ER362.01	Revision 3
Engineering Report	TR362.02	Revision 2
Engineering Report	ER362.03	Revision 0

AERO DESIGN LTD.

2013 – 39 Avenue N.E., Calgary, Alberta, T2E 6R7

Tel: 403-250-8027

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aerodesign@telusplanet.net

Installation Drawing, 407 Basket	60601	Revision 0
Installation Drawing, 407 Provisions	60602	Revision 0
Fabrication Drawing	60620	Revision 0
Fabrication Drawing	60621	Revision 0
Fabrication Drawing	60622	Revision 0
Fabrication Drawing	60624	Revision 0
Installation Drawing	49301	Revision 2
Fabrication Drawing	49311	Revision 2
Fabrication Drawing	49312	Revision 2
Installation Drawing	49201	Revision 1
Fabrication Drawing	49205	Revision 1
Fabrication Drawing	49207	Revision 1
Fabrication Drawing	49208	Revision 1
Fabrication Drawing	49209	Revision 1
Fabrication Drawing	49210	Revision 1
Fabrication Drawing	49211	Revision 1
Fabrication Drawing	49212	Revision 0
Fabrication Drawing	49213	Revision 1
Fabrication Drawing	49214	Revision 0
Fabrication Drawing	49215	Revision 0
Fabrication Drawing	49216	Revision 0
Fabrication Drawing	49217	Revision 1
Fabrication Drawing	49218	Revision 1
Fabrication Drawing	49219	Revision 0
Fabrication Drawing	49221	Revision 1
Installation Drawing	36201	Revision 2
Fabrication Drawing	36202, Sht 1 of 3	Revision 1
Fabrication Drawing	36202, Sht 2 of 3	Revision 1
Fabrication Drawing	36202, Sht 3 of 3	Revision 1
Fabrication Drawing	36203	Revision 2
Fabrication Drawing	36204	Revision 1
Fabrication Drawing	36210	Revision 1
Fabrication Drawing	36255	Revision 1
Fabrication Drawing	36261	Revision 1
Fabrication Drawing	36262	Revision 1
Fabrication Drawing	36271	Revision 0
Fabrication Drawing	36272	Revision 0
Fabrication Drawing	36273	Revision 0
Fabrication Drawing	36274	Revision 0
Fabrication Drawing	36275	Revision 1

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Fabrication Drawing

Fabrication Drawing

Fabrication Drawing

Fabrication Drawing

Fabrication Drawing

36276 Revision 0

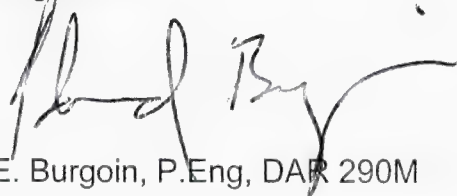
36277 Revision 0

36278 Revision 1

36280, Sheet 1 Revision 2

36280, Sheet 2 Revision 2

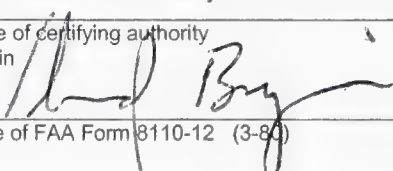
Regards,



E. Burgoin, P.Eng, DAR 290M

Encl.

No certificate may be issued unless a completed application form has been received.

U.S DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION		FORM APPROVED O.M.B. No. 04-R0078
APPLICATION FOR TYPE CERTIFICATE, PRODUCTION CERTIFICATE, OR SUPPLEMENTAL TYPE CERTIFICATE		
1. Name and address of applicant AERO Design Ltd. 2013 - 39th Avenue Northeast Calgary, Alberta, Canada, T2E 6R7	2. Application made for: <input type="checkbox"/> Type Certificate <input type="checkbox"/> Production Certificate <input checked="" type="checkbox"/> Supplemental Type Certificate	3. Product involved: <input checked="" type="checkbox"/> Aircraft <input type="checkbox"/> Engine <input type="checkbox"/> Propeller
4. TYPE CERTIFICATE (Complete item 4a below)		
a. Model designation(s) (All models listed are to be completely described in the required technical data, including drawings representing the design, material specifications, construction and performance of the aircraft, aircraft engine propeller which is the subject of this application.		
5. PRODUCTION CERTIFICATE (Complete items 5a - c below. Submit with this form in manual form one copy of quality control data or changes thereto covering new products as required by applicable FAR)		
a. Factory address (If different from above)	b. Application if for: <input type="checkbox"/> New Production Certificate <input type="checkbox"/> Additions to Production Certificate (Give P.C. No.)	P.C. No
c. Applicant is holder of license under a Type Certificate or a Supplemental Type Certificate (Attach evidence of licensing agreement and give certificate number)		T.C. / S.T.C. No.
6. SUPPLEMENTAL TYPE CERTIFICATE (complete items 6a - d below)		
a. Make and model designation of product to be modified Bell 206L Series, Bell 407		
b. Description of modification Installation of a Cargo Basket and External Attachment Provisions per Transport Canada STC SH00-48, Issue 3, 21 July, 2004 or subsequent approved revision.		
c. Will data be available for sale or release to other persons? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		d. Will parts be manufactured for sale? (Ref: FAR 21.303) <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
7. CERTIFICATION - I certify that the above statements are true.		
Signature of certifying authority E. Burgoin 	Title President, DAR 290M	Date 9 August, 2004

MODIFICATION APPROVAL REQUEST APPLICATION FORM

MOD606, Rev. 1

1. NAME AND ADDRESS OF APPLICANT:

AERO Design Ltd.
2013 39th Ave NE
Calgary, AB, T2E 6R7

2. IDENTIFICATION OF PRODUCT

MAKE:

Bell Helicopter (Textron)

MODEL:

206L Series, 407

ALL CORRESPONDANCE TO:

AERO Design Ltd.
2013 39th Ave N.E.
Calgary, AB T2E 6R7

SERIAL No.:

All eligible

REGISTRATION:

All eligible

3. REQUEST FOR:

- A. SUPPLEMENTAL TYPE CERTIFICATE (STC) ☐
- B. STC/STA REVISION ☐ STC/STA No. _____
- C. LIMITED SUPPLEMENTAL TYPE CERTIFICATE (LSTC) ☐
- D. LIMITED STC/STA REVISION ☐ LSTC/LSTA No. _____
- E. F.A.A. SUPPLEMENTAL TYPE CERTIFICATE ☒
- F. F.A.A. STC REVISION ☐ STC No. _____
- G. FAMILIARIZATION OF F.A.A. STC ☐ STC No. _____
- H. REPAIR DESIGN APPROVAL (RDC) ☐
- I. PARTS DESIGN APPROVAL (PDA) ☐

4. TITLE OF MODIFICATION OR REPAIR:

Cargo Basket Installation

5. BRIEF DESCRIPTION OF MODIFICATION OR REPAIR:

Installation of cargo basket on the side of the helicopter. Requires provisions for mounting the basket that replace the landing gear attachment fittings.

6. APPLICABLE TYPE APPROVAL (TA) OR TYPE CERTIFICATE (TC) DOCUMENTS:

A. TA NO. H-92

B. TC No. _____

C. OTHER _____

7. PROPOSED BASIS OF APPROVAL:

A. SAME AS TA ☒ B. SAME AS TC ☐ C. OTHER ☐ (Please specify) _____

8. DOCUMENTATION CHECKLIST	REQUIRED		FOR DOT USE ONLY		
	YES	NO	RECEIVED		DATE
			YES	NO	
COMPLIANCE PROGRAM	X				
MASTER DRAWING LIST	X				
FLIGHT MANUAL SUPPLEMENT	X				
MAINTENANCE MANUAL SUPPLEMENT		X			
INSTRUCTIONS FOR CONTINUING AIRWORTHINESS	X				
ENGINEERING REPORTS	X				
DESIGN DRAWINGS		X			
MANUFACTURE DRAWINGS & INSTALLATION INSTRUCTIONS	X				
ELECTRICAL LOAD ANALYSIS		X			
DRAFT STC, LSTC OR RDA		X			
WEIGHT AND MOMENT CHANGE	X				
FLIGHT TEST DATA	X				
OTHER (Specify)					

9. APPLICANT'S REMARKS:

10. In addition to the payment of Aircraft Certification approval fees as prescribed in Canadian Aviation Regulations (CAR) Section 104, I agree to reimburse Transport Canada incremental expenses as in Aviation Regulation Directive No. 3, or equivalent, as applicable. For further details governing cost recovery, refer to AMA 513/4.

AERO Design Ltd

PER: 

SIGNATURE OF APPLICANTS

Consultant

TITLE

9 August, 2004

DATE

11.

SIGNATURE OF REGIONAL ENGINEER

DATE



Transport Canada Transports Canada

Department of Transport

Supplemental Type Certificate

This approval is issued to:

Aero Design Ltd.
2013 - 39 Avenue, N.E.
Calgary, Alberta
Canada T2E 6R7

Number: SH00-48

Issue No.: 3

Approval Date: December 08, 2000

Issue Date: July 21, 2004

Responsible Office:

Prairie and Northern

Aircraft/Engine Type or Model:

BELL 206L, 206L-1, 206L-3, 206L-4, 407

Canadian Type Certificate or Equivalent:

H-92

Description of Type Design Change:

Installation of Cargo Basket / External Attachment Provisions.

Installation/Operating Data,
Required Equipment and Limitations:

Bell 407 only:

Configuration A - External Cargo Basket High Mounted

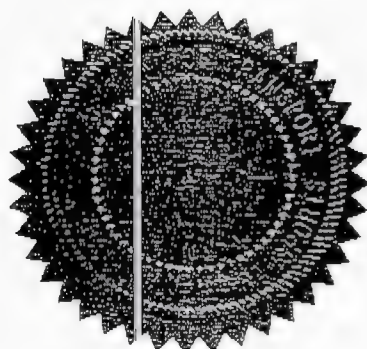
AERO Design Ltd. Cargo Basket to be completed in accordance with Transport Canada approved, AERO Design Ltd. Document Control List DCL 362, Rev. 2, dated 23 November 2000, or later approved revision. Applicable placard required on basket lid in accordance with Installation Drawing 36201.

Transport Canada approved AERO Design Ltd. Flight Manual Supplement FMS362.01 Revision 1, dated 14 November 2000, or later approved revision, is required with this installation.

AERO Design Ltd. Maintenance Manual Supplement MMS362.01, Revision 0, dated 15 November 2000, or later Transport Canada accepted revision, is required with this installation.

Basis of Certification is as defined by the applicable Type Certificate Data Sheets.

(see continuation sheet)



Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated **will not** adversely affect the airworthiness of the modified product.

D.S. Austen
For Minister of Transport

Canada



(Continuation Sheet)

Number: SH00-48 Issue 3

NOTE: THIS ADDENDUM SHALL REMAIN PART OF THE CERTIFICATE REFERRED TO THEREIN.

Bell 407 only (Continued):

Configuration B - External Cargo Basket Low Mounted

Installation of the External Cargo Basket is to be completed in accordance with Transport Canada Approved, AERO Design Ltd. Document Control List DCL606, Revision 1, dated 20 July 2004, or later approved revision. High skid gear is required for the basket installation. Placard is required for the basket lid.

Transport Canada approved, AERO Design Ltd., Flight Manual Supplement FMS 606.01, Revision 0, dated 25 March 2004, or later approved revision, is required with this installation.

AERO Design Ltd. Maintenance Instructions MI 606.01, Revision 2, dated 19 July 2004, or later Transport Canada accepted revision, is required with this installation.

External Attachment Provisions installed in accordance with drawing 60602 may remain installed if the basket installation is removed.

Basis of Certification is as defined by the applicable Type Certificate Data Sheets.

Bell 206L, L-1, L-3, L-4 only:

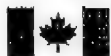
Configuration A - External Attachment Provisions Only:

Installation of the External Attachment Provisions is to be completed in accordance with Transport Canada approved, AERO Design Ltd., Document Control List DCL 493, Rev. 5, dated 20 July 2004, or later approved revision.

Transport Canada approved AERO Design Ltd. Flight Manual Supplement FMS 493.01, Revision 0, dated 19 May 2002, or later approved revision, is required with this installation.

AERO Design Ltd. Maintenance Instructions MI 493.01, Revision 2, dated 19 July 2004, or later Transport Canada accepted revision, is required with this installation.

(see continuation sheet)



(Continuation Sheet)

Number: SH00-48 Issue 3

NOTE: THIS ADDENDUM SHALL REMAIN PART OF THE CERTIFICATE REFERRED TO THEREIN.

Bell 206L, L-1, L-3, L-4 only: (continued)

Basis of Certification is as defined by the applicable Type Certificate Data Sheets, plus FAR 27 amendment 27-24.

Configuration B – External Cargo Basket Low Mounted:

Installation of Configuration A, External Attachment Provisions is a prerequisite for installation of Configuration B, External Cargo Basket installation. Installation of the cargo basket is to be completed in accordance with Transport Canada approved, AERO Design Ltd., Document Control List DCL492, Revision 4, dated 20 July 2004, or later approved revision. High skid gear is required for the basket installation. Flacard is required on the basket lid.


Transport Canada approved AERO Design Ltd., Flight Manual Supplement FMS 492.01, Revision 1, dated 25 June 2002, or later approved revision, is required with this installation.

AERO Design Ltd. Maintenance Instructions MI 492.01, Revision 3, dated 19 July 2004, or later Transport Canada accepted revision, is required with this installation.

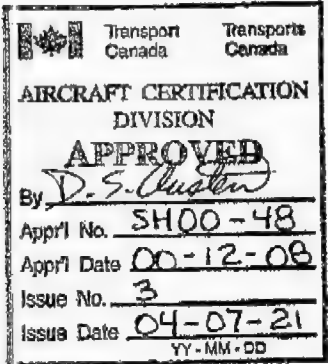
Basis of Certification is as defined by the applicable Type Certificate Data Sheets, plus FAR 27 amendment 27-24.

-- END --


DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
60601	Cargo Basket Installation	0
60602	External Attachment Provisions Installation	0
FMS606.01	Flight Manual Supplement	0
MI606.01	Maintenance Instructions	2
FABRICATION DOCUMENTS		
60620	Block Fabrication	0
60621	Forward Fitting Fabrication	0
60622	Barrel Nut Fabrication	0
60624	Barrel Nut Fabrication	0
49205	Cargo Basket Assembly	1
49207	Cargo Basket Lid	1
49208	Cargo Basket Body	1
49209	End Hoop Assembly	1
49210	Basket Components - Hoops	1
49211	Basket Components - Rim	1
49212	Basket Components - Rim	0
49213	Basket Components - Lid Brace	1
49214	Basket Components - Spine	0
49215	Basket Components - Spacer	0
49216	Basket Components - Spacer	0
49217	Basket Components - Lug	1
49218	Placard	1
49219	Spacer	0
49221	Support Beams	1
36255	Handle Assembly	1
36261	Handle Bar Assembly	1
36262	Handle Bracket Assembly	1
36271	Handle Lever	0
36272	Basket Bracket	0
36273	Lid Bracket	0
36274	Bushing	0
36275	Bushing	1
36276	Spring Hook	0
36277	Handle Bar	0
36278	Spring	1
36280, Sheet 1	Brace	2
36280, Sheet 2	Brace	2
ENGINEERING DOCUMENTS		
ER606.01	Engineering Report - Basket Installation	0
ER606.02	Engineering Report - Load Test	0
ER492.01	Engineering Report - Basket Installation	0
ER492.02	Engineering Report - Basket Load Tests	0
ER493.01	Engineering Report - External Attachment Prov.	0
APPROVAL:		
 Transport Canada Transports Canada AIRCRAFT CERTIFICATION DIVISION APPROVED By <i>D. S. Austin</i> Appr'l No. <u>SH00-48</u> Appr'l Date <u>00-12-08</u> Issue No. <u>3</u> Issue Date <u>04-07-21</u> YY-MM-DD	ORIGINAL DATE: 31 May, 2004	AERO DESIGN LTD. 2013 - 39 th Avenue N.E. Calgary, Alberta T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333
	REVISION DATE: 20 July, 2004	
	SHEET 1 OF 1	BELL 407 Side-Mounted Cargo Basket Installation
	DCL606	
		Rev. 1

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
49301	External Attachment Provisions Installation	2 ✓
FMS493.01	Flight Manual Supplement	0 ✓
MI 493.01	Maintenance Instructions	2 ✓
FABRICATION DOCUMENTS		
49311	Forward Fitting	0
49312	Aft Fitting	0
49311	Forward Fitting	2
49312	Aft Fitting	2
49319	Washer	0
49320	Barrel Nut	0
49320	Barrel Nut	1
49321	Spacer	0
ENGINEERING DOCUMENTS		
ER493.01	Engineering Report	0
ER493.03	Test Report	0
261.02	Honeycomb Insert Load Test Report	0
APPROVAL:		
 <p>Transport Canada AIRCRAFT CERTIFICATION DIVISION APPROVED By <i>D. S. Austin</i> App'l No. <u>SH00-48</u> App'l Date <u>00-12-08</u> Issue No. <u>3</u> Issue Date <u>04-07-21</u> YY-MM-DD</p>		<p>ORIGINAL DATE: 18 May, 2002</p> <p>REVISION DATE: 20 July, 2004</p> <p>AERO DESIGN LTD. 2013 - 35th Avenue NE Calgary, Alberta T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333</p>
SHEET 1 OF 1		BELL 206L SERIES External Attachment Provisions
DCL493		Rev. 5

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
49201	Cargo Basket Installation	1
FMS492.01	Flight Manual Supplement	1
MI492.01	Maintenance Instructions	3
FABRICATION DOCUMENTS		
49205	Cargo Basket Assembly	1
49207	Cargo Basket Lid	1
49208	Cargo Basket Body	1
49209	End Hoop Assembly	1
49210	Basket Components - Hoops	1
49211	Basket Components - Rim	1
49212	Basket Components - Rim	0
49213	Basket Components - Lid Brace	1
49214	Basket Components - Spine	0
49215	Basket Components - Spacer	0
49216	Basket Components - Spacer	0
49217	Basket Components - Lug	1
49218	Placard	1
49219	Spacer	0
49221	Support Beams	1
36255	Handle Assembly	1
36261	Handle Bar Assembly	1
36262	Handle Bracket Assembly	1
36271	Handle Lever	0
36272	Basket Bracket	0
36273	Lid Bracket	0
36274	Bushing	0
36275	Bushing	1
36276	Spring Hook	0
36277	Handle Bar	0
36278	Spring	1
36280, Sheet 1	Brace	2
36280, Sheet 2	Brace	2
ENGINEERING DOCUMENTS		
ER492.01	Engineering Report - Basket Installation	0
ER492.02	Engineering Report - Basket Load Tests	0
APPROVAL:		
 Transport Canada Transports Canada AIRCRAFT CERTIFICATION DIVISION APPROVED By <u>D.S. Austin</u> Appr'l No. <u>SH00-48</u> Appr'l Date <u>00-12-08</u> Issue No. <u>3</u> Issue Date <u>04-07-21</u> YY-MM-DD	ORIGINAL DATE: 17 May, 2002	AERO DESIGN LTD. 2013 - 39 th Ave. NE Calgary, Alberta T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333
	REVISION DATE: 20 July, 2004	
	SHEET 1 OF 1	BELL 206L SERIES Side-Mounted Cargo Basket Installation
	Rev. DCL492 4	

AERO DESIGN LTD.

FMS606.01

BELL 407

ROTORCRAFT FLIGHT MANUAL SUPPLEMENT for the INSTALLATION of the AERO DESIGN CARGO BASKET

Supplemental Type Certificate No. SH00-48

Sections I, II, III and IV of this document comprise the Transport Canada Approved sections of this Flight Manual Supplement. Compliance with Section I, Limitations, is mandatory.

Section V and any subsequent sections if present are Unapproved and are provided for information only.

The information and data contained in this Flight Manual Supplement supersede or supplement that contained in the basic Approved Flight Manual for the Bell 407 when fitted with the Cargo Basket. For limitations, procedures and performance not listed in this Flight Manual Supplement, refer to the Approved Flight Manual and other approved Flight Manual Supplements.



Revision 0
25 March, 2004

JUL 21 2004 Page 1
TRANSPORT CANADA APPROVED

AERO DESIGN LTD.

FMS606.01

Table of Contents

I	Limitations	3
II	Normal Procedures	3
III	Emergency Procedures	3
IV	Performance	4
V	Weight and Balance	5

Revision 0
25 March, 2004

JUL 21 2004 Page 2
TRANSPORT CANADA APPROVED

I LIMITATIONS

1. The maximum load in the AERO Design Ltd. Cargo Basket is 200 Lb. (90.9 kg).
2. Flight operations limited to VFR conditions with AERO Design Ltd. Cargo Basket installed.
3. Maximum lateral or rearward speed limited to 25 KIAS.
4. Maximum winds from aft quadrants limited to 25 KIAS for takeoff, landing or hover flight.
5. V_{NE} is 140 KIAS except when the V_{NE} of the basic rotorcraft is more restrictive, in which case the lower V_{NE} applies.

II NORMAL PROCEDURES

1. Pre-flight inspections:
 - a) Ensure that all cargo stored in the cargo basket does not extend outside the basket, is properly tied down and secured for flight.
 - b) Ensure that the lid of cargo basket is closed and secured.

CAUTION

It is possible to exceed the lateral centre of gravity limits of the rotorcraft under some loading conditions. Pilots must ensure that lateral C of G is within limits when loading the basket.

III EMERGENCY PROCEDURES

No change from basic Approved Flight Manual.

CAUTION:

The rotorcraft glide angle is steeper than that of the basic helicopter when the AERO Design Ltd. Cargo Basket is installed.

Revision 0
25 March, 2004

JUL 21 2004 Page 3
TRANSPORT CANADA APPROVED

AERO DESIGN LTD.

FMS606.01

IV PERFORMANCE

Climb performance may be reduced by up to 200 fpm.

Cruise speeds are reduced by approximately 10 kts. (11 mph).

Revision 0
25 March, 2004

JUL 21 2004 Page 4
TRANSPORT CANADA APPROVED

AERO DESIGN LTD.

FMS606.01

V WEIGHT AND BALANCE

English Units

Item	Weight (Lb)	Longitudinal		Lateral	
		Arm (in)	Moment (in*Lb)	Arm (in)	Moment (in*Lb)
Cargo Basket Installation	66.0	113.3	7476	30.5	2013
Cargo	200 (MAX)	114.1	22820	38.5	7700

Metric Units

Item	Weight (Kg)	Longitudinal		Lateral	
		Arm (mm)	Moment (mm*Kg)	Arm (mm)	Moment (mm*Kg)
Cargo Basket Installation	30.0	2878	86 314	775	23 241
Cargo	90.9 (MAX)	2898	263 487	978	88 900

Longitudinal and Lateral moment arms are given only for the center of the Cargo Basket. Due to the length of the basket, some loading arrangements may require that actual moment arms be measured, to determine the correct moments about the center of gravity.

CAUTION:

It is possible to exceed lateral CG limits in some configurations. For example, with one pilot, no passengers, fuel tanks half empty, and the AERO Design Ltd. cargo basket loaded with 200 pounds of cargo, the Lateral CG of the rotorcraft could be out of limits.

Revision 0
25 March, 2004

Page 5

THIS DRAWING CONTAINS INFORMATION AND DATA WHICH IS PROPRIETARY TO AERO DESIGN LTD. THIS DRAWING, OR ANY PORTION THEREOF, MAY NOT BE REPRODUCED, COPIED, OR DUPLICATED IN ANY MANNER, NOR USED FOR MANUFACTURING WITHOUT THE WRITTEN CONSENT OF AERO DESIGN LTD. BY ACCEPTING THIS DRAWING FOR REFERENCE, THE RECIPIENT AGREES TO HOLD AERO DESIGN LTD. HARMLESS FROM THE USE, OR MISUSE, OF THIS DRAWING OR THE INFORMATION CONTAINED THEREON.

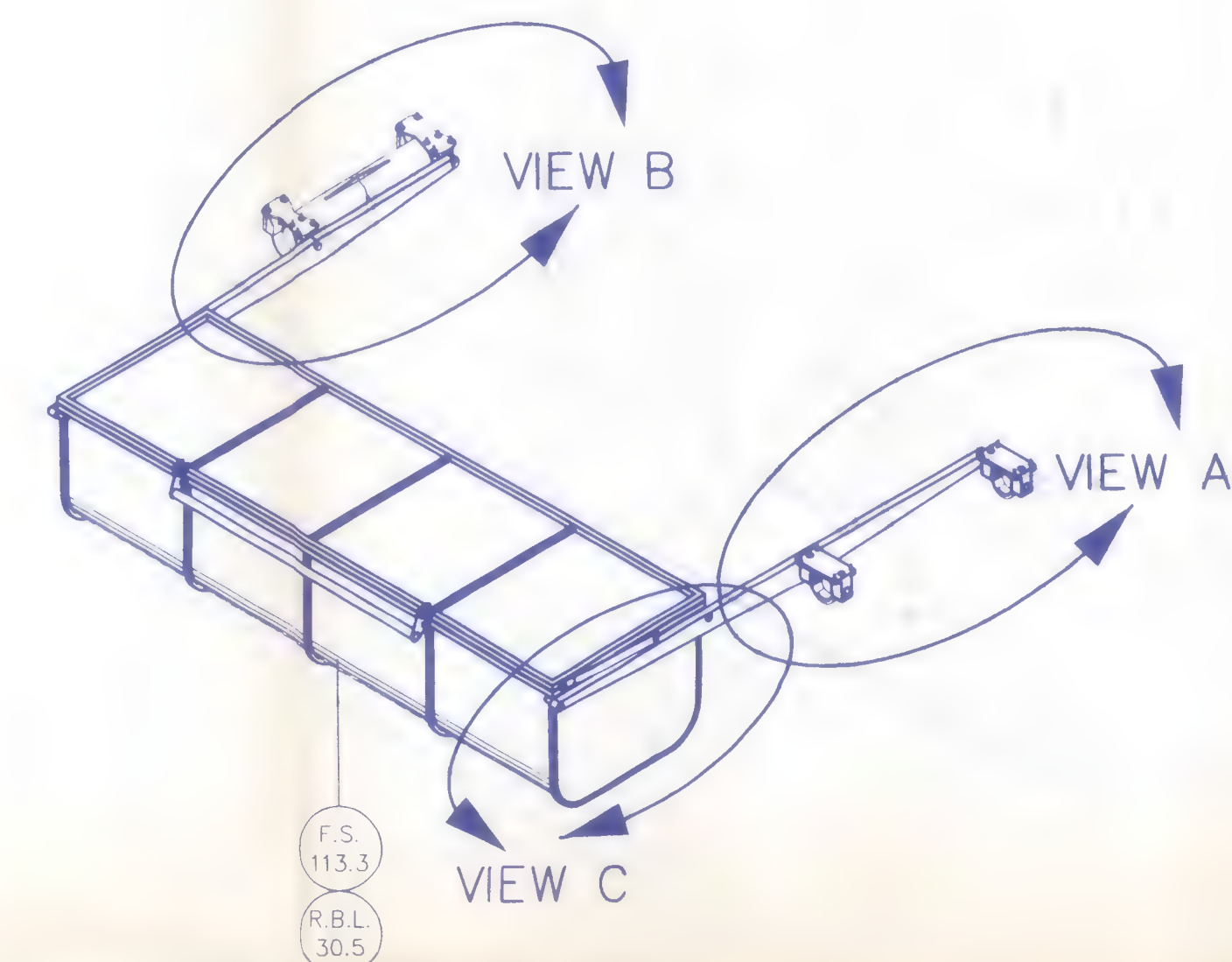
IF NECESSARY, INSTALL LID BRACE USING:
AN3-17A BOLT
AN970-3 WASHER
AN960-10 WASHER
MS21044N3 NUT

IF NECESSARY, INSTALL LID BRACE USING:
AN3-15A BOLT
AN970-3 WASHER
AN960-10 WASHER
MS21044N3 NUT

AN4-24A BOLT
AN960-10 WASHER
49219-01 SPACER
MS21044N4 NUT
TYPICAL 4 PLACES

03 AFT BEAM SIMILAR

VIEW C
TYPICAL FORE AND AFT

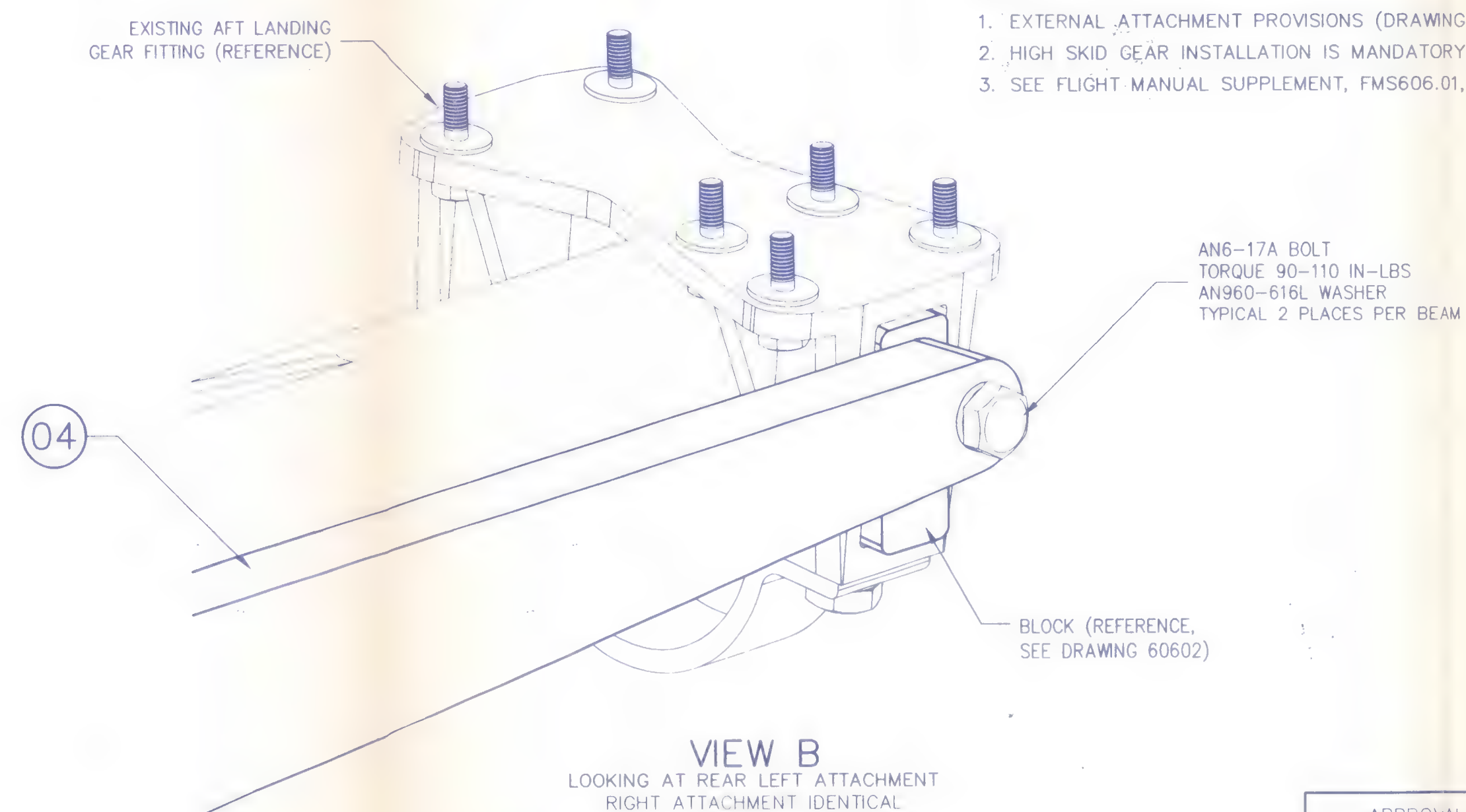


EXTERNAL ATTACHMENT
FITTING (REFERENCE,
SEE DRAWING 60602)

AN6-17A BOLT
TORQUE 90-110 IN-LBS
AN960-616L WASHER
TYPICAL 2 PLACES PER BEAM

03

VIEW A
LOOKING AT FORWARD LEFT ATTACHMENT
RIGHT ATTACHMENT IDENTICAL



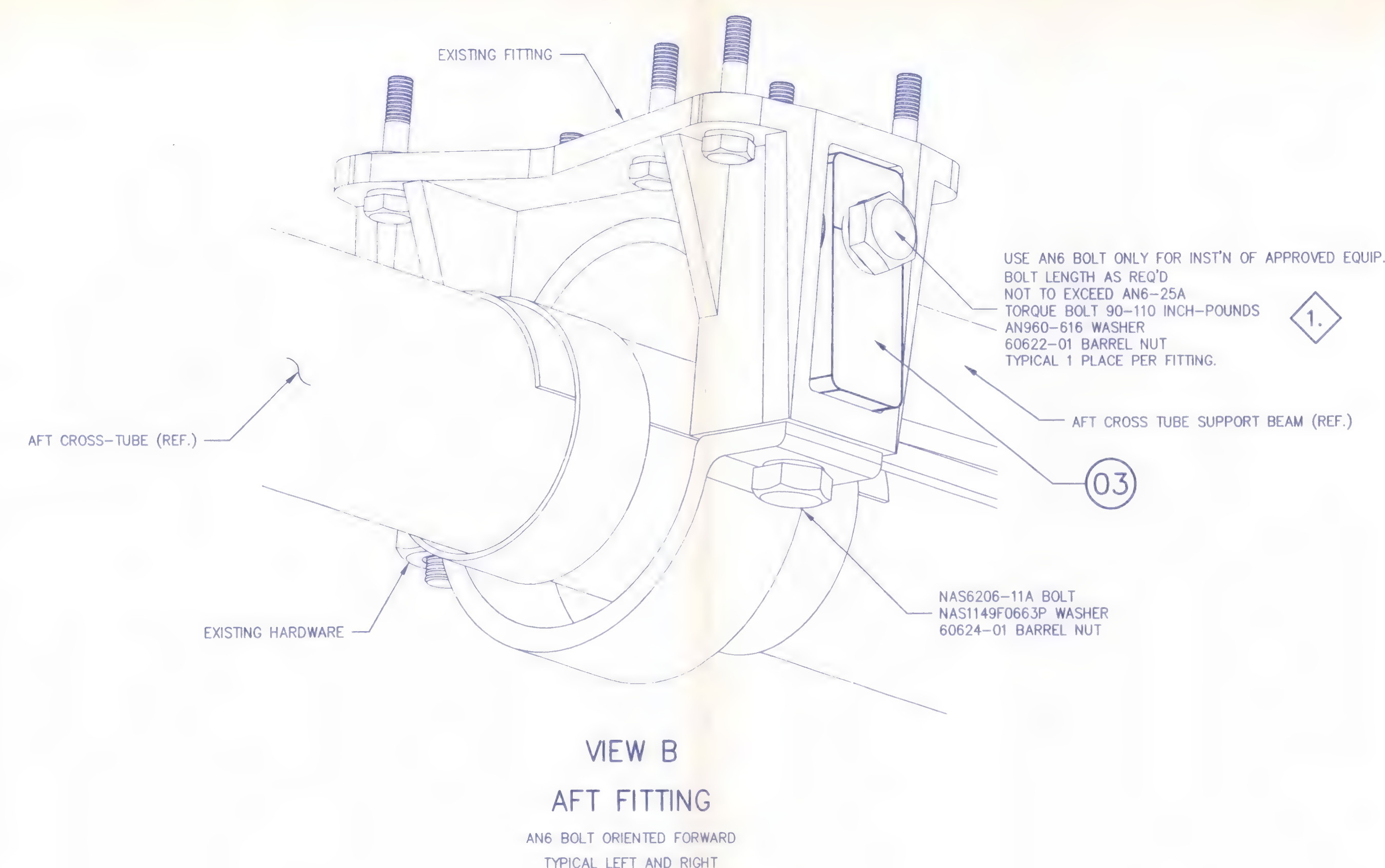
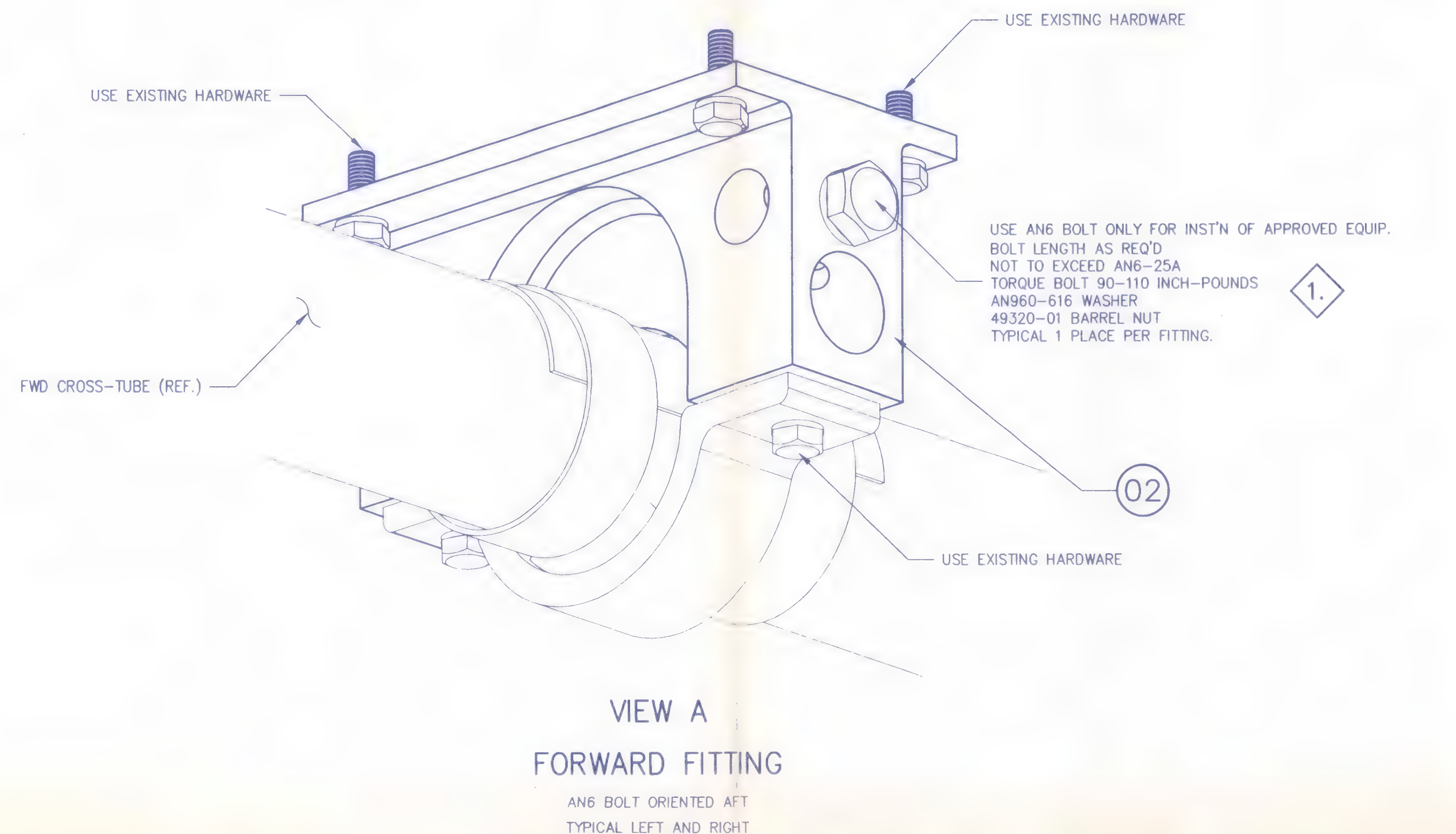
- NOTES:
1. EXTERNAL ATTACHMENT PROVISIONS (DRAWING 60602) INSTALLATION IS MANDATORY PREREQUISITE FOR THIS INSTALLATION.
 2. HIGH SKID GEAR INSTALLATION IS MANDATORY PREREQUISITE FOR THIS INSTALLATION.
 3. SEE FLIGHT MANUAL SUPPLEMENT, FMS606.01, FOR LIMITATIONS ON HELICOPTER OPERATIONS WITH CARGO BASKET INSTALLED.

2	MS21044N3		NUT	
2	AN960-10		WASHER	
2	AN970-3		WASHER	
1	AN3-15A		BOLT	
1	AN3-17A		BOLT	
4	MS21044N4		NUT	
8	AN960JD416		WASHER	
4	AN4-24A		BOLT	
4	AN960JD616		WASHER	
4	AN6-17A		BOLT	
4	49219-01	05	SPACER	
1	49221-02	04	AFT BEAM	
1	49221-01	03	FORWARD BEAM	
1	49205-01	02	CARGO BASKET ASSEMBLY	
	60601-01	01	INSTALLATION	
01	PART NO.	ITEM	DESCRIPTION	MATERIAL
QTY.	LIST OF MATERIALS			

APPROVALS		DATE		AERO DESIGN LTD.				
DRAWN:	JEFF CLARKE		25 MAR 2004		CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M 2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7 tel: (403) 250-8027 fax: (403) 250-8333 aerodesign@telusplanet.net			
CHECKED:	E. BURGOIN				BELL 407 SIDE MOUNTED CARGO BASKET INSTALLATION			
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON:								
DECIMALS		ANGLES						
X.XXX		±0.010		±1/2"				
X.XX		±0.03						
X.X		±0.1						
				DWG. SIZE		DWG. NO.		
NOT TO SCALE				A1		60601		
SHEET 1 OF 1						REV.		
						0		

WEIGHT AND BALANCE						
ITEM	DESCRIPTION	WEIGHT (LB)	LONGITUDINAL		LATERAL	
			ARM (IN)	MOMENT (LB-IN)	ARM (IN)	MOMENT (LB-IN)
01	CARGO BASKET INSTALLATION	66	113.3	7475.8	30.5	2013
	CARGO	200 MAX	114.1	22818	38.5	7700

NOTICE			
THIS DRAWING CONTAINS INFORMATION AND DATA WHICH IS PROPRIETARY TO AERO DESIGN LTD. THIS DRAWING, OR ANY PORTION THEREOF, MAY NOT BE REPRODUCED, COPIED, OR DUPLICATED IN ANY MANNER, NOR USED FOR MANUFACTURING WITHOUT THE WRITTEN CONSENT OF AERO DESIGN LTD. BY ACCEPTING THIS DRAWING FOR REFERENCE, THE RECIPIENT AGREES TO HOLD AERO DESIGN LTD. HARMLESS FROM THE USE, OR MISUSE, OF THIS DRAWING OR THE INFORMATION CONTAINED THEREON.			
REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	CREATED FROM 49301, REV. 1	BJC	24 MAR 2004

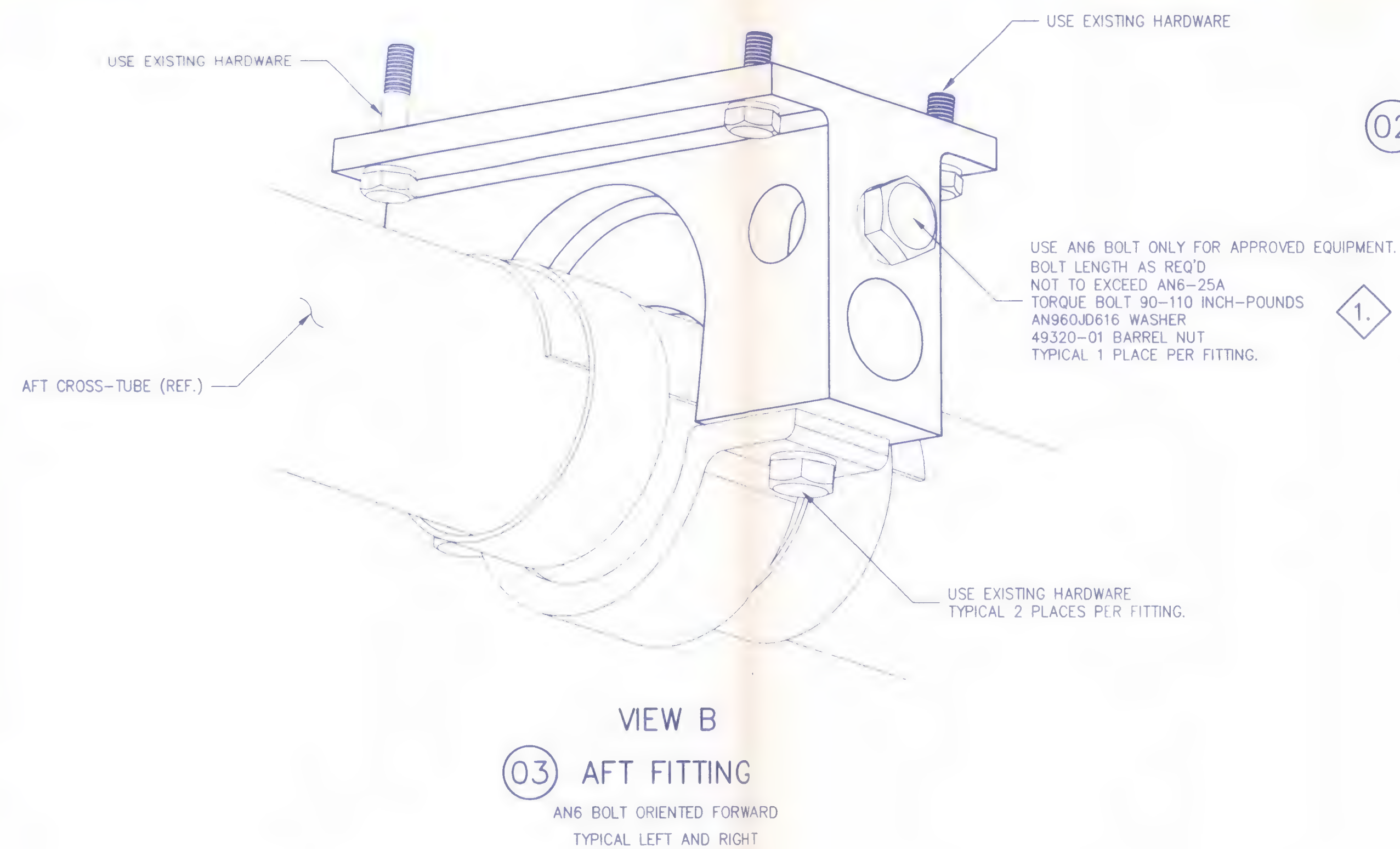
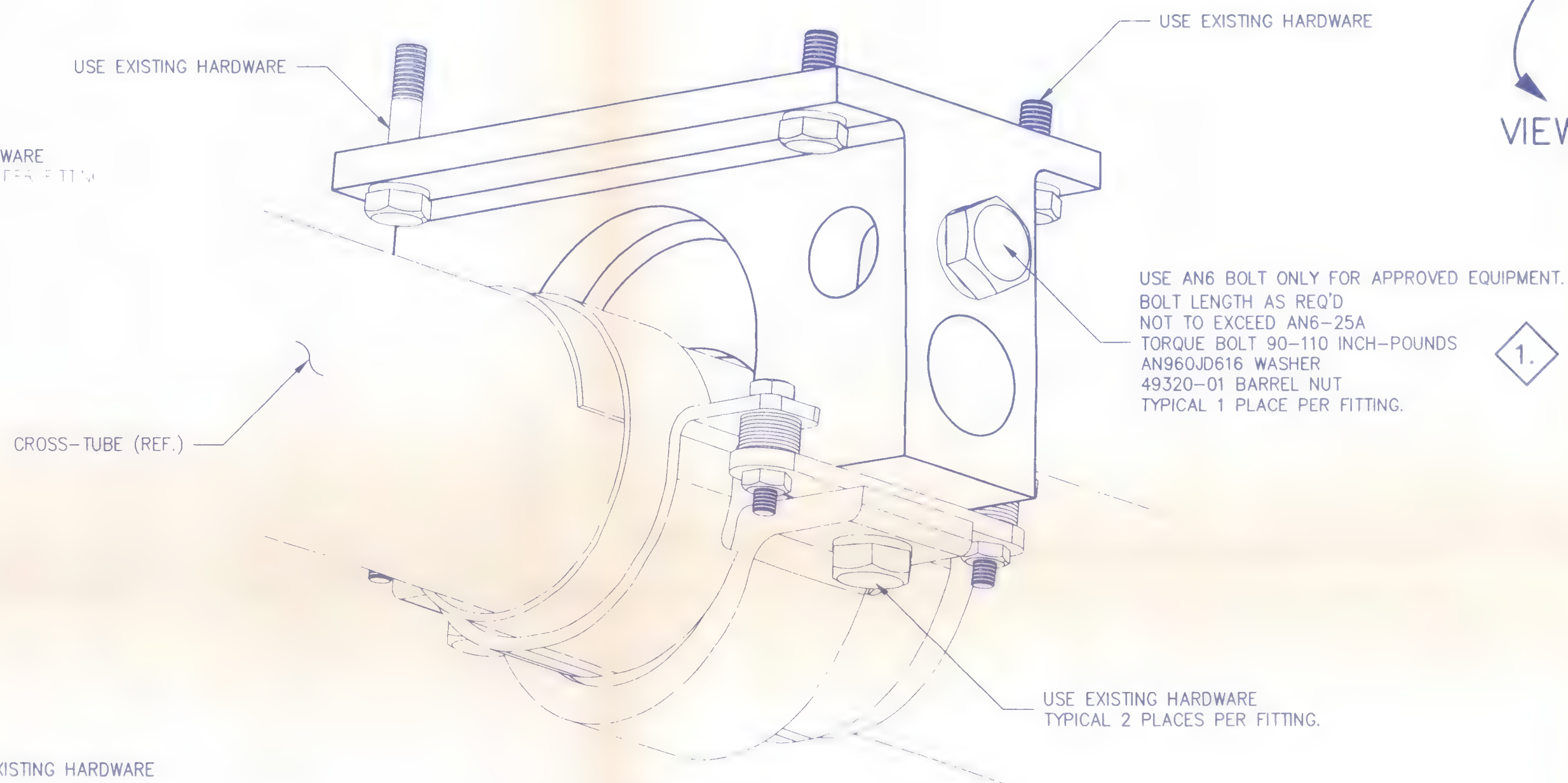
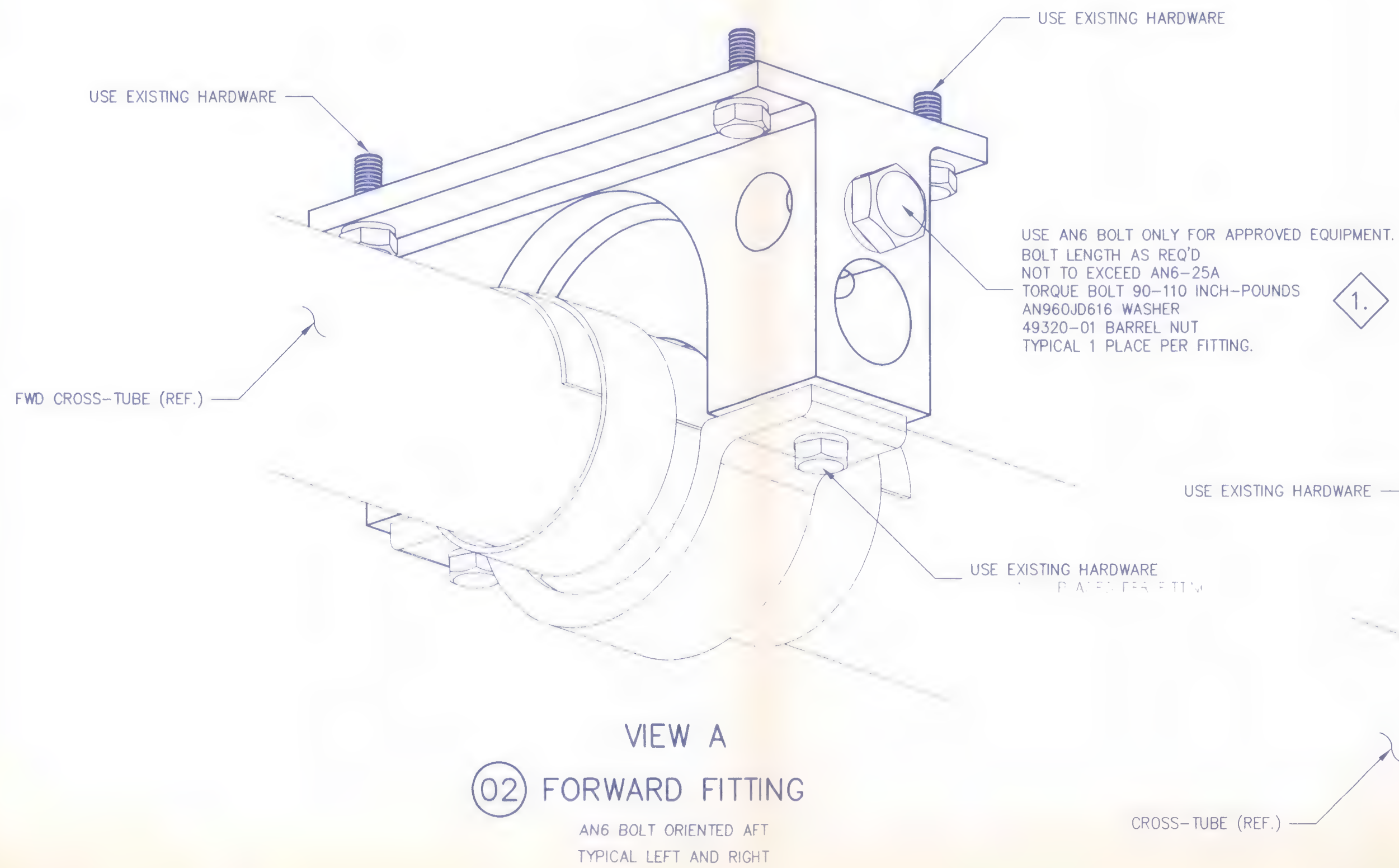


- NOTES:
- ATTACHMENT OF ANY EQUIPMENT TO EXTERNAL ATTACHMENT PROVISIONS REQUIRES TRANSPORT CANADA APPROVAL.
 - RAISE HELICOPTER USING HOIST OR JACK RATED FOR OVER 5000 POUNDS WHEN CHANGING FITTINGS.
 - REMOVE BELL FORWARD LANDING GEAR FITTINGS AND RETAIN ALL HARDWARE AND PARTS REMOVED.
 - INSTALL FORWARD FITTINGS USING EXISTING HARDWARE. REFER TO I.P.C. AND M.M. FOR HARDWARE TO BE INSTALLED ON EACH SPECIFIC MODEL AND SERIAL NUMBER OF HELICOPTER.
 - FORWARD FITTING SHALL BE ORIENTED WITH AN6 BOLT ON AFT SIDE. BLOCK SHALL BE INSTALLED ON FORWARD SIDE OF AFT FITTING.
 - REMOVE BARREL NUTS FROM FORWARD FITTINGS WHEN PROVISIONS NOT IN USE. REMOVE BLOCK FROM AFT FITTINGS WHEN PROVISIONS NOT IN USE.
 - TORQUE AN6 BOLT 90-110 INCH-POUNDS WHEN IN USE BY EQUIPMENT INSTALLATION.
 - WEIGH FITTINGS REMOVED AND AMEND WEIGHT AND BALANCE DOCUMENTS ACCORDINGLY.

1	NAS1149F0663P	WASHER
1	NAS6206-11	BOLT
1	AN960-616	WASHER
4	AN6	3/8" BOLT (WHEN PROVISION IS USED NOT TO EXCEED AN6-25)
2	60622-01	06 BARREL NUT
2	49320-01	05 BARREL NUT
2	60624-01	04 BARREL NUT
2	60620-01	03 BLOCK
2	60621-01	02 FORWARD FITTING
2	60602-01	01 INSTALLATION
01	PART NO.	ITEM DESCRIPTION
QTY. LIST OF MATERIALS OF MATERIALS		
APPROVALS		DATE
DRAWN: JEFF CLARKE		25 MAR 2004
CHECKED: E. BURGON		
AERO DESIGN LTD. CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M 2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7 tel: (403) 250-8027 fax: (403) 250-8333 aerodesign@telusplanet.net		
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2" X.XX ±0.03 X.X ±0.1		
BELL 407 EXTERNAL ATTACHMENT PROVISIONS INSTALLATION		
NOT TO SCALE	DWG. SIZE	DWG. NO.
SHEET 1 OF 1	A1	60602
		REV. 0

WEIGHT AND BALANCE						
ITEM	DESCRIPTION	WEIGHT (LB)	LONGITUDINAL ARM (IN)	MOMENT (LB-IN)	LATERAL ARM (IN)	MOMENT (LB-IN)
02	FORWARD FITTING (PAIR)	3.5	73.00	255.5	0	0
03	BLOCK (PAIR)	1	155.22	155.22	0	0

NOTICE			
THIS DRAWING CONTAINS INFORMATION AND DATA WHICH IS PROPRIETARY TO AERO DESIGN LTD. THIS DRAWING, OR ANY PORTION THEREOF, MAY NOT BE REPRODUCED, COPIED, OR DUPLICATED IN ANY MANNER, NOR USED FOR MANUFACTURING WITHOUT THE WRITTEN CONSENT OF AERO DESIGN LTD. BY ACCEPTING THIS DRAWING FOR REFERENCE, THE RECIPIENT AGREES TO HOLD AERO DESIGN LTD. HARMLESS FROM THE USE, OR MISUSE, OF THIS DRAWING OR THE INFORMATION CONTAINED THEREON.			
REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
1	ALTERNATE HARDWARE CONFIGURATION	STF	JUN 24/02
2	CORRECTED NOTES	STF	MAY 03/04



(ALTERNATE INSTALLATION)
(02)(03) AFT AND/OR FORWARD FITTING
WHERE SPRING SUPPORT HARDWARE IS EXISTING
TYPICAL LEFT AND RIGHT

- NOTES:
- ATTACHMENT OF ANY EQUIPMENT TO EXTERNAL ATTACHMENT PROVISIONS REQUIRES TRANSPORT CANADA APPROVAL.
 - RAISE HELICOPTER USING HOIST OR JACK RATED FOR OVER 5000 POUNDS WHEN CHANGING FITTINGS.
 - REMOVE BELL LANDING GEAR FITTINGS AND RETAIN ALL HARDWARE AND PARTS REMOVED.
 - INSTALL EXTERNAL ATTACHMENT PROVISIONS USING EXISTING HARDWARE. REFER TO I.P.C. AND M.M. FOR HARDWARE TO BE INSTALLED ON EACH SPECIFIC MODEL AND SERIAL NUMBER OF HELICOPTER.
 - FORWARD FITTING SHALL BE ORIENTED WITH AN6 BOLT ON AFT SIDE. AFT FITTING FACES FORWARD.
 - REMOVE BARREL NUTS WHEN PROVISIONS NOT IN USE.
 - TORQUE AN6 BOLT 90-110 INCH-POUNDS WHEN IN USE BY EQUIPMENT INSTALLATION.
 - WEIGH FITTINGS REMOVED AND AMEND WEIGHT AND BALANCE DOCUMENTS ACCORDINGLY.

WEIGHT AND BALANCE					
ITEM	DESCRIPTION	WEIGHT (LB)	LONGITUDINAL ARM (IN)	MOMENT (LB-IN)	LATERAL ARM (IN)
02	FORWARD FITTING (EACH)	1.75	73.0	127.8	0
03	AFT FITTING (EACH)	1.85	155.2	287.1	0
TOTAL		7.2	115.2	829.8	0

4	AN960JD616	WASHER
4	AN6	3/8" BOLT (WHEN PROVISION IS USED NOT TO EXCEED AN6-25A)
4	49320-01	04 BARREL NUT
2	49312-01	03 AFT FITTING
2	49311-01	02 FORWARD FITTING
2	49301-01	01 INSTALLATION
01	PART NO.	ITEM DESCRIPTION
QTY.	LIST OF MATERIALS OF MATERIALS	
APPROVALS		DATE
DRAWN:	STEVEN FAHEY	MAY 17/02
CHECKED:	E. BURGAIN	MAY 17/02
STRESS:		
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON:		
DECIMALS		ANGLES
X.XXX		±0.010
X.XX		±0.03
X.X		±0.1
A1		49301
SHEET 1 OF 1		2

AERO DESIGN LTD.
ENGINEERING CONSULTANTS
1045 McTAVISH ROAD N.E.
CALGARY, ALBERTA T2E 7G9

BELL 206L
EXTERNAL ATTACHMENT PROVISIONS
INSTALLATION

NOT TO SCALE
DWG. NO. 49301
REV. 2

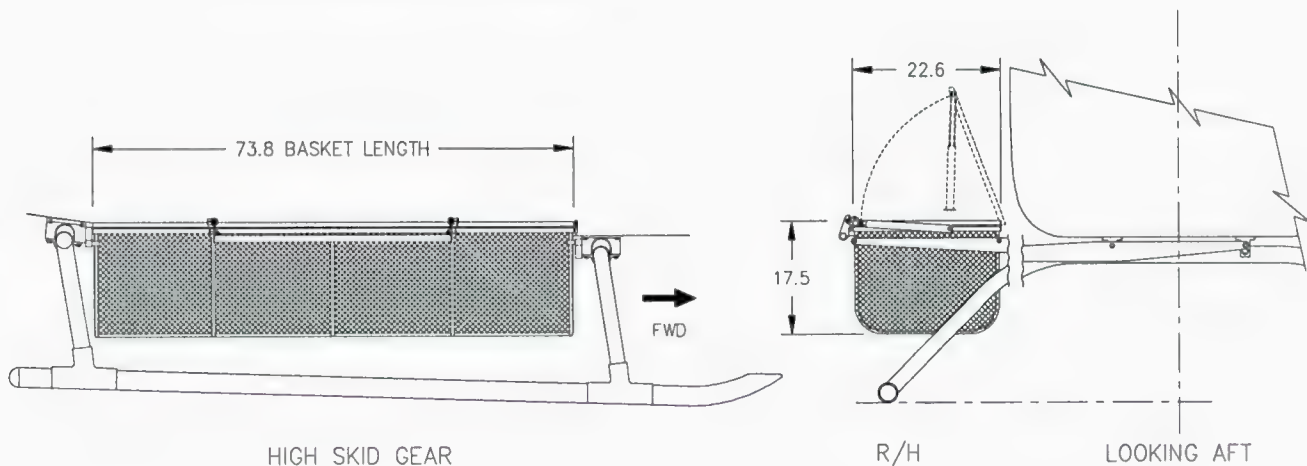
BELL 407 & 206 LONGRANGER EXTERNAL CARGO BASKET



Shown above installed on Bell 206L

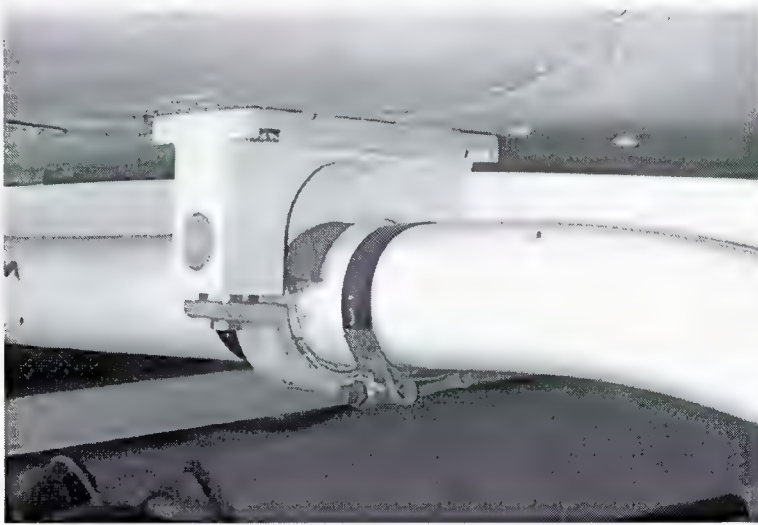
FEATURES:

- Carries up to 200 pounds
- Installed on right-hand side
- No airspeed restrictions
- Once provisions are installed, one man can attach and detach basket in minutes
- Lid latches automatically when closed

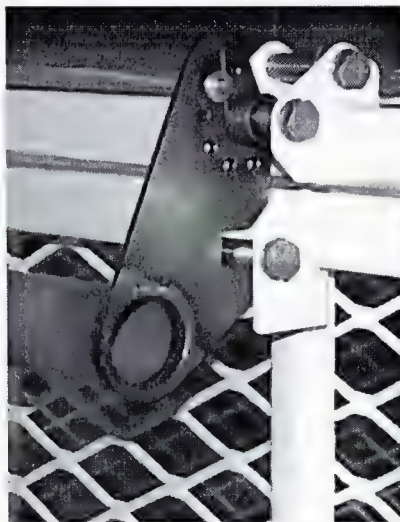


BELL 407 & 206 LONGRANGER EXTERNAL CARGO BASKET

This installation incorporates a set of bolt-on landing gear fittings that provide attachment points for the beams of the basket.



AERO Design Ltd.'s cargo baskets also feature an ingenious automatic locking mechanism on the handle, allowing easy opening, and drop-down closing that keeps the lid shut.



**HANDLE DOWN AND LOCKED
LIFT TO RELEASE AND OPEN**



**SPRING-LOADED HANDLE
READY TO LOCK CLOSED**

AERO DESIGN LTD.

2013 – 39th Ave N. E., Calgary, Alberta, T2E 6R7

aerodesign@telusplanet.net

F A X C O V E R S H E E T

DATE: July 23, 2004

TIME: 3:33 PM

TO: **Gerry Kearney**
Omega Aviation

PHONE: 604-220-2742

FAX: 604-273-8991

FROM: S. Fahey
Aero Design Ltd.

PHONE: 403-250-8027

FAX: 403-250-8333

Number of pages including cover sheet: 7

RE: APPROVAL FOR BELL 407 CARGO BASKET

Gerry,

Here are the rest of the stamped documents. This, plus the fax from yesterday, makes a complete package of approval documents. You're ready to go now!

Document Control List

DCL 606

Revision 1

Flight Manual Supplement

FMS 606.01

Revision 0

Steve

AERO DESIGN LTD.

2013 – 39th Ave N. E., Calgary, Alberta, T2E 6R7

aerodesign@telusplanet.net

F A X C O V E R S H E E T

DATE: July 22, 2004

TO: **Gerry Kearney**
Omega Aviation

FROM: S. Fahey
Aero Design Ltd.

TIME: 4:38 PM

PHONE: 604-220-2742

FAX: 604-273-8991

PHONE: 403-250-8027

FAX: 403-250-8333

Number of pages including cover sheet: 9

RE: APPROVAL FOR BELL 407 CARGO BASKET

Gerry,

This finally came through the fax machine.

Supplemental Type Certificate	SH00-48	Issue 3
Flight Manual Supplement	FMS 606.01	Revision 0

I will have better copies to send to you shortly.

Steve



Transport Canada Transports Canada

Department of Transport

Supplemental Type Certificate

This approval is issued to:

Aero Design Ltd.
2013 - 39 Avenue, N.E.
Calgary, Alberta
Canada T2E 6R7

Number: SH00-48

Issue No.: 3

Approval Date: December 08, 2000

Issue Date: July 21, 2004

Responsible Office:

Prairie and Northern

Aircraft/Engine Type or Model:

BELL 206L, 206L-1, 206L-3, 206L-4, 407

Canadian Type Certificate or Equivalent:

H-92

Description of Type Design Change:

Installation of Cargo Basket / External Attachment Provisions.

Installation/Operating Data,
Required Equipment and Limitations:

Bell 407 only:

Configuration A - External Cargo Basket High Mounted

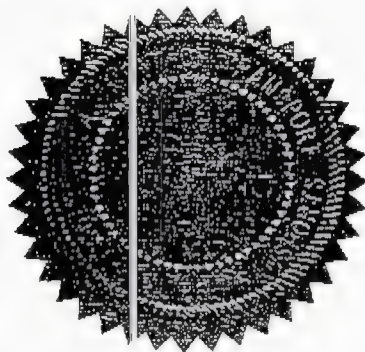
AERO Design Ltd. Cargo Basket to be completed in accordance with Transport Canada approved, AERO Design Ltd. Document Control List DCL 362, Rev. 2, dated 23 November 2000, or later approved revision. Applicable placard required on basket lid in accordance with Installation Drawing 36201.

Transport Canada approved AERO Design Ltd. Flight Manual Supplement FMS362.01 Revision 1, dated 14 November 2000, or later approved revision, is required with this installation.

AERO Design Ltd. Maintenance Manual Supplement MMS362.01, Revision 0, dated 15 November 2000, or later Transport Canada accepted revision, is required with this installation.

Basis of Certification is as defined by the applicable Type Certificate Data Sheets.

(see continuation sheet)



Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated **will not** adversely affect the airworthiness of the modified product.

D.S. Austen
For Minister of Transport

Canada



(Continuation Sheet)

Number: SH00-48 Issue 3

NOTE: THIS ADDENDUM SHALL REMAIN PART OF THE CERTIFICATE REFERRED TO THEREIN.

Bell 407 only (Continued):

Configuration B - External Cargo Basket Low Mounted

Installation of the External Cargo Basket is to be completed in accordance with Transport Canada Approved, AERO Design Ltd. Document Control List DCL606, Revision 1, dated 20 July 2004, or later approved revision. High skid gear is required for the basket installation. Placard is required for the basket lid.

Transport Canada approved, AERO Design Ltd., Flight Manual Supplement FMS 606.01, Revision 0, dated 25 March 2004, or later approved revision, is required with this installation.

AERO Design Ltd. Maintenance Instructions MI 606.01, Revision 2, dated 19 July 2004, or later Transport Canada accepted revision, is required with this installation.

External Attachment Provisions installed in accordance with drawing 60602 may remain installed if the basket installation is removed.

Basis of Certification is as defined by the applicable Type Certificate Data Sheets.

Bell 206L, L-1, L-3, L-4 only:

Configuration A - External Attachment Provisions Only:

Installation of the External Attachment Provisions is to be completed in accordance with Transport Canada approved, AERO Design Ltd., Document Control List DCL 493, Rev. 5, dated 20 July 2004, or later approved revision.

Transport Canada approved AERO Design Ltd. Flight Manual Supplement FMS 493.01, Revision 0, dated 19 May 2002, or later approved revision, is required with this installation.

AERO Design Ltd. Maintenance Instructions MI 493.01, Revision 2, dated 19 July 2004, or later Transport Canada accepted revision, is required with this installation.

(see continuation sheet)



(Continuation Sheet)

Number: SH00-48 Issue 3

NOTE: THIS ADDENDUM SHALL REMAIN PART OF THE CERTIFICATE REFERRED TO THEREIN.

Bell 206L, L-1, L-3, L-4 only: (continued)

Basis of Certification is as defined by the applicable Type Certificate Data Sheets, plus FAR 27 amendment 27-24.

Configuration B - External Cargo Basket Low Mounted:

Installation of Configuration A, External Attachment Provisions is a prerequisite for installation of Configuration B, External Cargo Basket installation. Installation of the cargo basket is to be completed in accordance with Transport Canada approved, AERO Design Ltd., Document Control List DCL492, Revision 4, dated 20 July 2004, or later approved revision. High skid gear is required for the basket installation. Placard is required on the basket lid.

Transport Canada approved AERO Design Ltd., Flight Manual Supplement FMS 492.01, Revision 1, dated 25 June 2002, or later approved revision, is required with this installation.

AERO Design Ltd. Maintenance Instructions MI 492.01, Revision 3, dated 19 July 2004, or later Transport Canada accepted revision, is required with this installation.

Basis of Certification is as defined by the applicable Type Certificate Data Sheets, plus FAR 27 amendment 27-24.

-- END --

BELL 407

ROTORCRAFT FLIGHT MANUAL SUPPLEMENT for the **INSTALLATION of the AERO DESIGN CARGO BASKET**

Supplemental Type Certificate No. SH00-48

Sections I, II, III and IV of this document comprise the Transport Canada Approved sections of this Flight Manual Supplement. Compliance with Section I, Limitations, is mandatory.

Section V and any subsequent sections if present are Unapproved and are provided for information only.

The information and data contained in this Flight Manual Supplement supersede or supplement that contained in the basic Approved Flight Manual for the Bell 407 when fitted with the Cargo Basket. For limitations, procedures and performance not listed in this Flight Manual Supplement, refer to the Approved Flight Manual and other approved Flight Manual Supplements.

Table of Contents

I	Limitations	3
II	Normal Procedures	3
III	Emergency Procedures	3
IV	Performance	4
V	Weight and Balance	5

I LIMITATIONS

1. The maximum load in the AERO Design Ltd. Cargo Basket is 200 Lb. (90.9 kg).
2. Flight operations limited to VFR conditions with AERO Design Ltd. Cargo Basket installed.
3. Maximum lateral or rearward speed limited to 25 KIAS.
4. Maximum winds from aft quadrants limited to 25 KIAS for takeoff, landing or hover flight.
5. V_{NE} is 140 KIAS except when the V_{NE} of the basic rotorcraft is more restrictive, in which case the lower V_{NE} applies.

II NORMAL PROCEDURES

1. Pre-flight inspections:
 - a) Ensure that all cargo stored in the cargo basket does not extend outside the basket, is properly tied down and secured for flight.
 - b) Ensure that the lid of cargo basket is closed and secured.

CAUTION

It is possible to exceed the lateral centre of gravity limits of the rotorcraft under some loading conditions. Pilots must ensure that lateral C of G is within limits when loading the basket.

III EMERGENCY PROCEDURES

No change from basic Approved Flight Manual.

CAUTION:

The rotorcraft glide angle is steeper than that of the basic helicopter when the AERO Design Ltd. Cargo Basket is installed.

IV PERFORMANCE

Climb performance may be reduced by up to 200 fpm.

Cruise speeds are reduced by approximately 10 kts. (11 mph).

V WEIGHT AND BALANCE

English Units

Item	Weight (Lb)	Longitudinal		Lateral	
		Arm (in)	Moment (in*Lb)	Arm (in)	Moment (in*Lb)
Cargo Basket Installation	66.0	113.3	7476	30.5	2013
Cargo	200 (MAX)	114.1	22820	38.5	7700

Metric Units

Item	Weight (Kg)	Longitudinal		Lateral	
		Arm (mm)	Moment (mm*Kg)	Arm (mm)	Moment (mm*Kg)
Cargo Basket Installation	30,0	2878	86 314	775	23 241
Cargo	90.9 (MAX)	2898	263 467	978	88 900

Longitudinal and Lateral moment arms are given only for the center of the Cargo Basket. Due to the length of the basket, some loading arrangements may require that actual moment arms be measured, to determine the correct moments about the center of gravity.

CAUTION:

It is possible to exceed lateral CG limits in some configurations. For example, with one pilot, no passengers, fuel tanks half empty, and the AERO Design Ltd. cargo basket loaded with 200 pounds of cargo, the Lateral CG of the rotorcraft could be out of limits.

Aero Design

From: "Aero Design" <aerodesign@telusplanet.net>
To: "Staal, Jack" <STAALJ@tc.gc.ca>
Sent: Wednesday, July 21, 2004 10:27 AM
Attach: DCL606_1.pdf; DCL493_5.pdf; DCL492_4.pdf
Subject: Re: Maintenance Instructions for Bell 407 Cargo Bakset

Jack,

The Document Control Lists, as requested. Some dates and rev levels on the draft STC aren't correct any more, but the basic text doesn't change.

Steven Fahey steve.aerodesign@telusplanet.net
 Aero Design
 2013 - 39 Avenue NE
 Calgary, AB
 T2E 6R7
 ph: 403 250 8027
 fax: 403 250 8333

----- Original Message -----

From: "Staal, Jack" <STAALJ@tc.gc.ca>
 To: "Aerodesign (E-mail)" <aerodesign@telusplanet.net>
 Sent: Wednesday, July 21, 2004 9:55 AM
 Subject: FW: Maintenance Instructions for Bell 407 Cargo Bakset

Steve:

Could you fax or email the latest DCLs that reflect the latest documentation. I have DCLs with rev levels one lower than that reflected in your latest draft. MI rev levels bumped for Malcolm.

Trying to get this out today.

Thanks,
 Jack

-----Original Message-----

From: Stewart, Malcolm
 Sent: Tuesday, July 20, 2004 12:49 PM
 To: Staal, Jack
 Subject: FW: Maintenance Instructions for Bell 407 Cargo Bakset

I have completed the review iaw MSI 53. The ICA's are satisfactory. The completed Appendix A is being forwarded to you by internal mail.

Malcolm Stewart
 Civil Aviation Safety Inspector - Inspecteur de la sécurité de l'Aviation civile
 Tel / Tél (403) 292-5274 | facsimile / téléc (403) 292-6709 | TTY / ATS (613) 990-4500
 E-Mail: stewarm@tc.gc.ca Courrier électronique: stewarm@tc.gc.ca
 Transport Canada | Calgary Transport Canada Centre (RACH), 800, 1601 Airport Road N.E., Calgary, Alberta T2E 6Z8

Transports Canada | Centres de Transports Canada (RACH), 1601, route
Airport N.-E., bureau 800, Calgary, Alberta T2E 6Z8
Government of Canada | Gouvernement du Canada

-----Original Message-----

From: Aero Design [mailto:aerodesign@telusplanet.net]
Sent: Tuesday, July 20, 2004 11:27 AM
To: Stewart, Malcolm
Cc: Staal, Jack
Subject: Re: Maintenance Instructions for Bell 407 Cargo Bakset

Malcolm,

Enclosed are the final copies of the last two documents required. The MI
for the 407 is attached again so that Jack can have the complete set.

Steven Fahey steve.aerodesign@telusplanet.net
Aero Design
2013 - 39 Avenue NE
Calgary, AB
T2E 6R7
ph: 403 250 8027
fax: 403 250 8333

----- Original Message -----

From: "Stewart, Malcolm" <STEWARM@tc.gc.ca>
To: "Aero Design" <aerodesign@telusplanet.net>
Sent: Tuesday, July 20, 2004 8:59 AM
Subject: RE: Maintenance Instructions for Bell 407 Cargo Bakset

This is satisfactory. Please submit the other documents.

Malcolm Stewart
Civil Aviation Safety Inspector - Inspecteur de la sécurité de l'Aviation
civile
Tel / Tél (403) 292-5274 | facsimile / téléc (403) 292-6709 | TTY / ATS
(613) 990-4500
E-Mail: stewarm@tc.gc.ca Courrier électronique: stewarm@tc.gc.ca
Transport Canada | Calgary Transport Canada Centre (RACH), 800, 1601 Airport
Road N.E., Calgary, Alberta T2E 6Z8
Transports Canada | Centres de Transports Canada (RACH), 1601, route
Airport N.-E., bureau 800, Calgary, Alberta T2E 6Z8
Government of Canada | Gouvernement du Canada

-----Original Message-----

From: Aero Design [mailto:aerodesign@telusplanet.net]
Sent: Monday, July 19, 2004 4:13 PM
To: Stewart, Malcolm
Subject: Maintenance Instructions for Bell 407 Cargo Bakset

Malcolm,

I have attached revision 2 of the MI for the Bell 407, with changes as discussed. If you give the OK for this one, I will make changes likewise for the other two documents and send them to you shortly.

Steven Fahey steve.aerodesign@telusplanet.net

Aero Design

2013 - 39 Avenue NE

Calgary, AB

T2E 6R7

ph: 403 250 8027

fax: 403 250 8333

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
49201	Cargo Basket Installation	1
FMS492.01	Flight Manual Supplement	1
MI492.01	Maintenance Instructions	3
FABRICATION DOCUMENTS		
49205	Cargo Basket Assembly	1
49207	Cargo Basket Lid	1
49208	Cargo Basket Body	1
49209	End Hoop Assembly	1
49210	Basket Components – Hoops	1
49211	Basket Components – Rim	1
49212	Basket Components – Rim	0
49213	Basket Components – Lid Brace	1
49214	Basket Components – Spine	0
49215	Basket Components – Spacer	0
49216	Basket Components – Spacer	0
49217	Basket Components – Lug	1
49218	Placard	1
49219	Spacer	0
49221	Support Beams	1
36255	Handle Assembly	1
36261	Handle Bar Assembly	1
36262	Handle Bracket Assembly	1
36271	Handle Lever	0
36272	Basket Bracket	0
36273	Lid Bracket	0
36274	Bushing	0
36275	Bushing	1
36276	Spring Hook	0
36277	Handle Bar	0
36278	Spring	1
36280, Sheet 1	Brace	2
36280, Sheet 2	Brace	2
ENGINEERING DOCUMENTS		
ER492.01	Engineering Report – Basket Installation	0
ER492.02	Engineering Report – Basket Load Tests	0
APPROVAL:	ORIGINAL DATE: 17 May, 2002 REVISION DATE: 20 July, 2004	AERO DESIGN LTD. 2013 – 39 th Ave. NE Calgary, Alberta T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333
	SHEET 1 OF 1	BELL 206L SERIES Side-Mounted Cargo Basket Installation
	<div>Rev.</div> <div>DCL492</div> <div>4</div>	

DOCUMENT CONTROL

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
60601	Cargo Basket Installation	0
60602	External Attachment Provisions Installation	0
FMS606.01	Flight Manual Supplement	0
MI606.01	Maintenance Instructions	2
FABRICATION DOCUMENTS		
60620	Block Fabrication	0
60621	Forward Fitting Fabrication	0
60622	Barrel Nut Fabrication	0
60624	Barrel Nut Fabrication	0
49205	Cargo Basket Assembly	1
49207	Cargo Basket Lid	1
49208	Cargo Basket Body	1
49209	End Hoop Assembly	1
49210	Basket Components – Hoops	1
49211	Basket Components – Rim	1
49212	Basket Components – Rim	0
49213	Basket Components – Lid Brace	1
49214	Basket Components – Spine	0
49215	Basket Components – Spacer	0
49216	Basket Components – Spacer	0
49217	Basket Components – Lug	1
49218	Placard	1
49219	Spacer	0
49221	Support Beams	1
36255	Handle Assembly	1
36261	Handle Bar Assembly	1
36262	Handle Bracket Assembly	1
36271	Handle Lever	0
36272	Basket Bracket	0
36273	Lid Bracket	0
36274	Bushing	0
36275	Bushing	1
36276	Spring Hook	0
36277	Handle Bar	0
36278	Spring	1
36280, Sheet 1	Brace	2
36280, Sheet 2	Brace	2
ENGINEERING DOCUMENTS		
ER606.01	Engineering Report – Basket Installation	0
ER606.02	Engineering Report – Load Test	0
ER492.01	Engineering Report – Basket Installation	0
ER492.02	Engineering Report – Basket Load Tests	0
ER493.01	Engineering Report – External Attachment Prov.	0
APPROVAL:	ORIGINAL DATE: 31 May, 2004 REVISION DATE: 20 July, 2004	AERO DESIGN LTD. 2013 - 39 th Avenue N.E. Calgary, Alberta T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333
	SHEET 1 OF 1	BELL 407 Side-Mounted Cargo Basket Installation
	DCL606	Rev. 1

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
49301	External Attachment Provisions Installation	2
FMS493.01	Flight Manual Supplement	0
MI 493.01	Maintenance Instructions	2
FABRICATION DOCUMENTS		
49311	Forward Fitting	0
49312	Aft Fitting	0
49311	Forward Fitting	2
49312	Aft Fitting	2
49319	Washer	0
49320	Barrel Nut	0
49320	Barrel Nut	1
49321	Spacer	0
ENGINEERING DOCUMENTS		
ER493.01	Engineering Report	0
ER493.03	Test Report	0
261.02	Honeycomb Insert Load Test Report	0
APPROVAL:	ORIGINAL DATE: 19 May, 2002 REVISION DATE: 20 July, 2004	AERO DESIGN LTD. 2013 – 39 th Avenue NE Calgary, Alberta T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333
	SHEET 1 OF 1	BELL 206L SERIES External Attachment Provisions
	DCL493	Rev. 5

Aero Design

From: "Stewart, Malcolm" <STEWARM@tc.gc.ca>
To: "Aero Design" <aerodesign@telusplanet.net>
Sent: Tuesday, July 20, 2004 8:59 AM
Subject: RE: Maintenance Instructions for Bell 407 Cargo Bakset

This is satisfactory. Please submit the other documents.

Malcolm Stewart
Civil Aviation Safety Inspector - Inspecteur de la sécurité de l'Aviation civile
Tel / Tél (403) 292-5274 | facsimile / téléc (403) 292-6709 | TTY / ATS (613) 990-4500
E-Mail: stewarm@tc.gc.ca Courrier électronique: stewarm@tc.gc.ca
Transport Canada | Calgary Transport Canada Centre (RACH), 800, 1601 Airport Road N.E., Calgary, Alberta T2E 6Z8
Transports Canada | Centres de Transports Canada (RACH), 1601, route Airport N.-E., bureau 800, Calgary, Alberta T2E 6Z8
Government of Canada | Gouvernement du Canada

-----Original Message-----

From: Aero Design [<mailto:aerodesign@telusplanet.net>]
Sent: Monday, July 19, 2004 4:13 PM
To: Stewart, Malcolm
Subject: Maintenance Instructions for Bell 407 Cargo Bakset

Malcolm,

I have attached revision 2 of the MI for the Bell 407, with changes as discussed. If you give the OK for this one, I will make changes likewise for the other two documents and send them to you shortly.

Steven Fahey steve.aerodesign@telusplanet.net
Aero Design
2013 - 39 Avenue NE
Calgary, AB
T2E 6R7
ph: 403 250 8027
fax: 403 250 8333

Aero Design

From: "Aero Design" <aerodesign@telusplanet.net>
To: "Malcolm Stewart" <stewarm@tc.gc.ca>
Sent: Monday, July 19, 2004 4:13 PM
Attach: MI606.01_2.pdf
Subject: Maintenance Instructions for Bell 407 Cargo Bakset

Malcolm,

I have attached revision 2 of the MI for the Bell 407, with changes as discussed. If you give the OK for this one, I will make changes likewise for the other two documents and send them to you shortly.

Steven Fahey steve.aerodesign@telusplanet.net
Aero Design
2013 - 39 Avenue NE
Calgary, AB
T2E 6R7
ph: 403 250 8027
fax: 403 250 8333

AERO Design Ltd.

**MAINTENANCE INSTRUCTIONS
MI 492.01**

Cargo Basket and External Attachment Provisions

Bell 206L Series Helicopters

STC # SH00-48

Prepared by: S. Fahey

Revision 3, 19 July, 2004

This Maintenance Instruction document has been completely revised (19 July, 2004) and is accepted by Transport Canada, superseding MI 492.01 Revision 3, (16 July, 2004).

AERO Design Ltd.:	Mailing Address: 2013 – 39 th Avenue N E, Calgary Alberta T2E 6R7
	Telephone: (403) 250-8027; Facsimile: (403) 250-8333
	E-Mail aerodesign@telusplanet.net

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1.0 INTRODUCTION

The Cargo Basket mounts to the side of the Bell 206L Series helicopters, supported by two beams bolted to the External Attachment Provisions that replace the landing gear fittings. The Cargo Basket may face the Right or Left side of the helicopter.

2.0 DESCRIPTION

The Cargo Basket is installed on the Bell 206L helicopters in accordance with Installation Drawing 49201. The appropriate beams are bolted to the External Attachment Provisions with AN6 bolts (Figure 2.1), secured with barrel nuts inside the fittings.

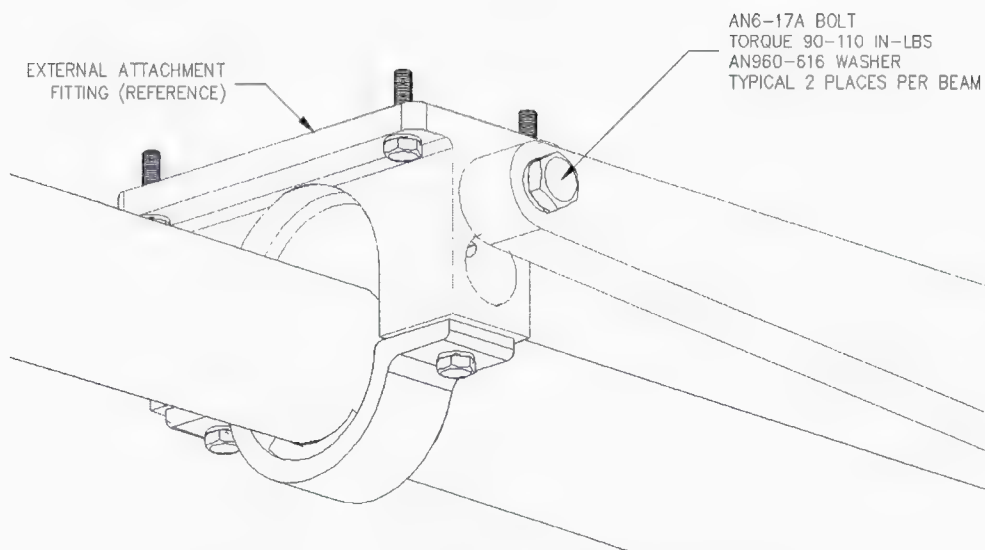


Figure 2.1 Attachment of Beam to Provisions

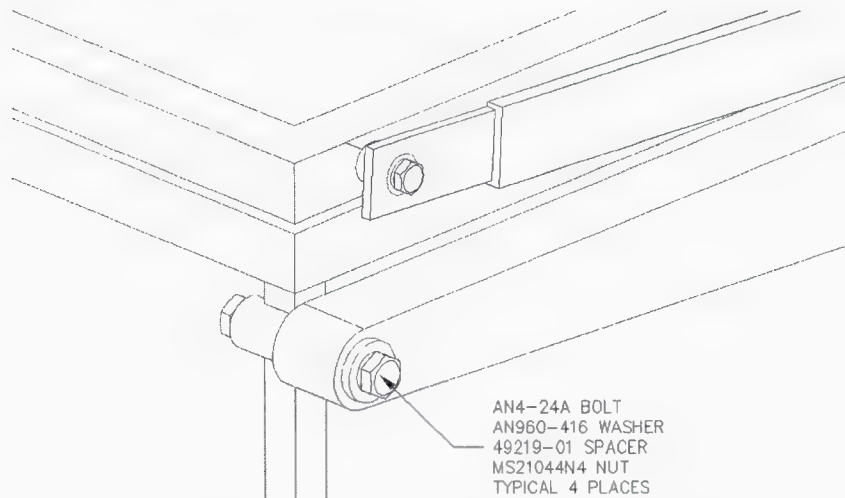


Figure 2.2 Attachment of Basket to Beam

The Basket is bolted to the beams with AN4 bolts (Figure 2.2).

Installation shall be performed to the standards described in AC43.13-1B, Chapter 7, Aircraft Hardware, Control Cables, and Turnbuckles.

Removal of the Cargo Basket is the reverse of the installation. The rotorcraft may be flown without the Cargo Basket and only the External Attachment Provisions installed.

See the Rotorcraft Maintenance Manual and Maintenance Instructions MI 493.01 for more information on the removal and installation of the landing gear fittings.

3.0 INSPECTION PROCEDURES

3.1 Basket

- Visually inspect tube-to-tube welds and mesh- to-tube welds every 100 hours for cracks, corrosion or other damage.
- Visually inspect basket mesh for damage every 100 hours.

3.2 Beams

- Visually inspect beams attaching basket to the helicopter every 100 hours in situ for cracks, corrosion or other damage.
- Visually inspect bolts attaching the basket to the beams every 100 in situ hours for security and damage.
- Visually inspect bolts attaching beams to external attachment provisions every 100 hours in situ for security and damage.

3.3 External Attachment Provisions

See Maintenance Instructions MI 493.01 for information on the inspection of the External Attachment Provisions.

4.0 REPAIR PROCEDURES

4.1 Basket

Repair Basket in accordance with AC43.13-1B, Chapter 4, Section 5, Welding, as required, where mesh-to-tube or tube-to-tube welds have come apart.

Basket is fabricated from the following materials:

- Lid and Rim: $\frac{3}{4}$ " x 0.035" square 4130 steel tube
- Frames: $\frac{1}{2}$ " x 0.035" square 4130 steel tube
- Mesh: $\frac{3}{4}$ " 18 ga. (0.040") expanded carbon steel mesh

Touch up with epoxy paint as required following repairs.

4.2 Beams

DO NOT REPAIR DAMAGE TO BEAMS IF BEYOND THE LIMITS BELOW.

- (a) Nicks and/or gouges on the top or bottom face up to 0.030" deep and 0.125" wide may be dressed out to a smooth contour.
- (b) Nicks and/or gouges on the side faces up to 0.060" deep and 0.125" wide may be dressed out to a smooth contour.
- (c) Nicks on the corners up to 0.125" deep may be dressed out.
- (d) For elongation of basket attachment holes (AN4 bolt):
 - 1. Ream hole to 0.375 (+0.0005/-0.0000)
 - 2. Insert NAS76A4-100 bushing
- (e) For elongation of helicopter attachment holes (AN6 bolt):
 - 1. Ream hole to 0.5000 (+0.0005/-0.0000)
 - 2. Insert NAS76A6-100 bushing
- (f) Touch up paint as required following repairs.

4.3 Landing Gear Attachment Fittings

See Maintenance Instructions MI 493.01 for information on the repair of the External Attachment Provisions.

5.0 LIMITATIONS

No overhaul time limitations or airworthiness limitations are applicable to the Cargo Basket.

AERO Design Ltd.

**MAINTENANCE INSTRUCTIONS
MI 493.01**

External Attachment Provisions

Bell 206L Series Helicopters

STC # SH00-48

Prepared by: S. Fahey

Revision 2, 19 July, 2004

This Maintenance Instruction document has been completely revised (19 July, 2004) and is accepted by Transport Canada, superseding MI 493.01 Revision 1, (16 July, 2004).

AERO Design Ltd.:	Mailing Address: 2013 – 39 th Avenue N E, Calgary Alberta T2E 6R7
	Telephone: (403) 250-8027; Facsimile: (403) 250-8333
	E-Mail aerodesign@telusplanet.net

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1.0 INTRODUCTION

The existing fittings which mount the helicopter on the landing gear cross tubes are replaced. The new fittings incorporate provisions for attaching external equipment to the helicopter. The External Attachment Provisions are intended for installation of an External Cargo Basket to the side of the helicopter, however Transport Canada approval may be issued for installation of other equipment.

2.0 DESCRIPTION

The External Attachment Provisions are installed on the Bell 206L series helicopter in accordance with Installation Drawing 49301. Each fitting is bolted to the lower fuselage and landing gear with the same fasteners as used for the original fittings, as shown in Figure 2.1.

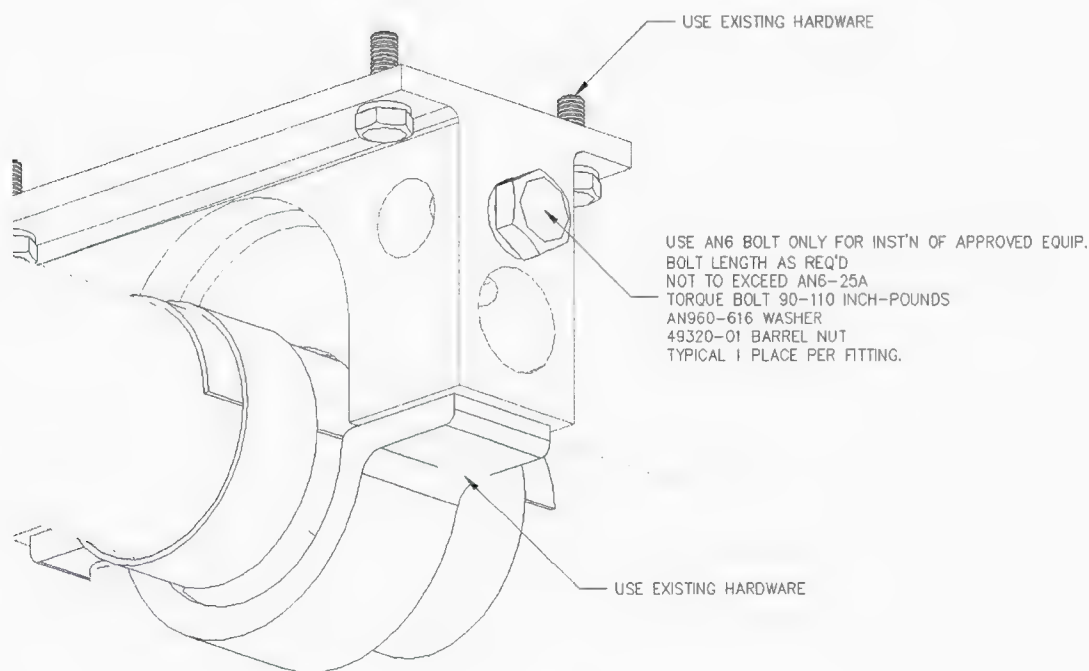


Figure 2.1 Installation of External Attachment Provisions

Installation shall be performed to the standards described in AC43.13-1B, Chapter 7, Aircraft Hardware, Control Cables, and Turnbuckles.

Removal of the External Attachment Provisions is the reverse of the installation. See the Rotorcraft Maintenance Manual for more information on the removal and installation of the landing gear fittings.

3.0 INSPECTION PROCEDURES

- Visually inspect fittings every 100 hours for cracks, corrosion or other damage.
- Visually inspect hardware attaching fittings and hardware attaching cross-tubes to fitting, every 100 hours in situ for security and damage.

4.0 REPAIR PROCEDURES

DO NOT REPAIR DAMAGE TO FITTINGS IF BEYOND THE LIMITS BELOW.

- (a) Nicks and/or gouges on any face up to 0.030" deep and 0.125" wide may be dressed out to a smooth contour. Touch up paint as required.
- (b) Do not repair elongation of provision bolt hole (AN6 bolt). Hole is nominally 0.391" in diameter with 1/4" maximum freedom of motion left and right.
- (c) Do not repair elongation of barrel nut hole. Hole is nominally 3/4" in diameter.

5.0 LIMITATIONS

No overhaul time limitations or airworthiness limitations are applicable to the External Attachment Provisions.

AERO Design Ltd.

**MAINTENANCE INSTRUCTIONS
MI 606.01**

Cargo Basket and External Attachment Provisions

Bell 407 Helicopter

STC # SH00-48

Prepared by: Jeff Clarke

Revision 2, 19 July, 2004

This Maintenance Instruction document has been completely revised (19 July, 2004) and is accepted by Transport Canada, superseding MI 606.01 Revision 1, (16 July, 2004).

AERO Design Ltd.:	Mailing Address: 2013 – 39 th Avenue N E, Calgary Alberta T2E 6R7
	Telephone: (403) 250-8027; Facsimile: (403) 250-8333
	E-Mail aerodesign@telusplanet.net

NOTICE: This manual contains information and data which is proprietary to AERO DESIGN LTD. This manual, or any part thereof, may not be reproduced, copied, duplicated or used without the written consent of AERO Design Ltd.

1.0 INTRODUCTION

The Cargo Basket mounts to the side of the Bell 407 helicopter, supported by two beams bolted to the External Attachment Provisions that replace the landing gear fittings. The Cargo Basket may face the Starboard or Port sides of the helicopter.

2.0 DESCRIPTION

External Attachment Provisions are installed on the Bell 407 in accordance with Installation Drawing 60602. The forward landing gear fittings are replaced with two similar fittings that incorporate provisions for mounting the basket (Figure 2.1). Smaller blocks are attached inside the cavity in the aft fittings for mounting the aft end of the basket (Figure 2.2).

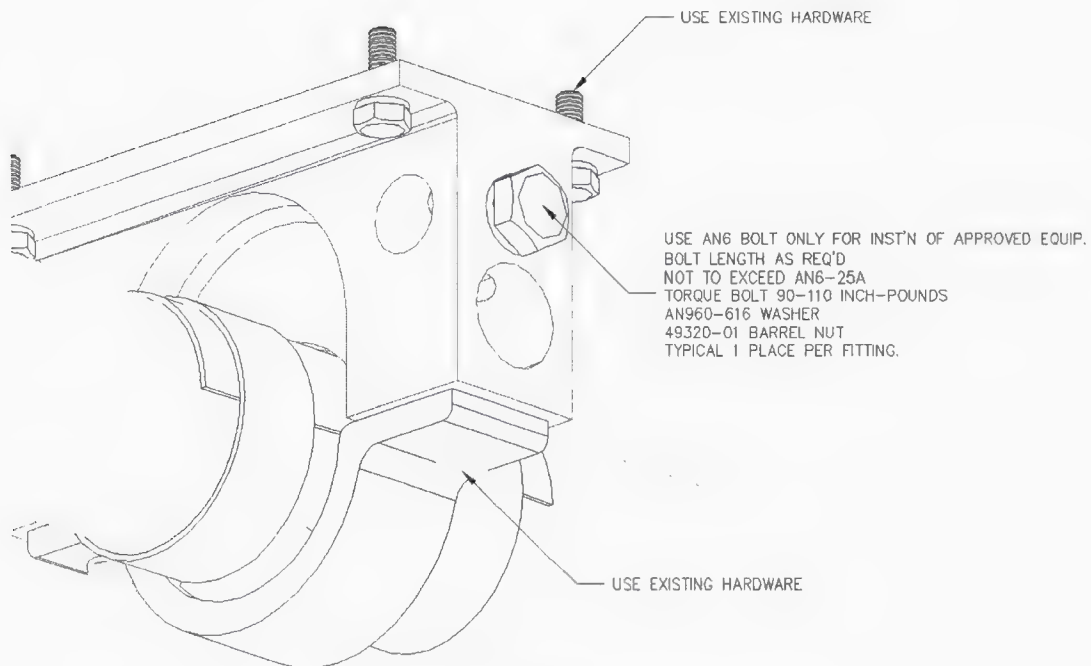


Figure 2.1 Installation of Forward Provisions

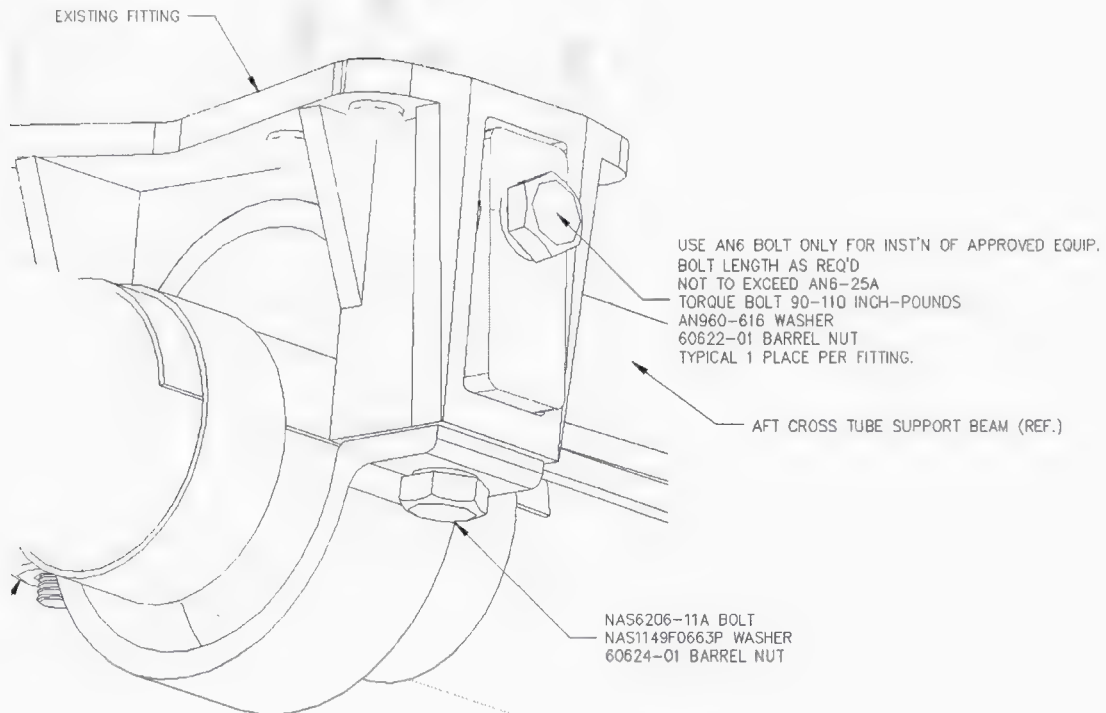


Figure 2.2 Installation of Aft Mounting Blocks in Landing Gear

The Cargo Basket is installed on the Bell 407 helicopter in accordance with Installation Drawing 60601. The appropriate beams are bolted to the External Attachment Provisions with AN6 bolts (Figure 2.3), secured with barrel nuts inside the fittings.

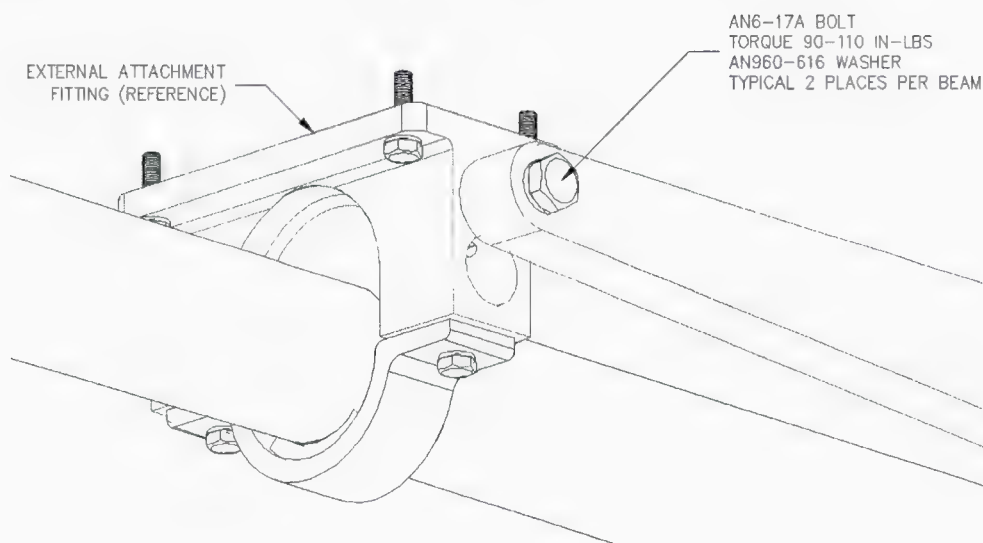


Figure 2.3 Attachment of Beam to Provisions

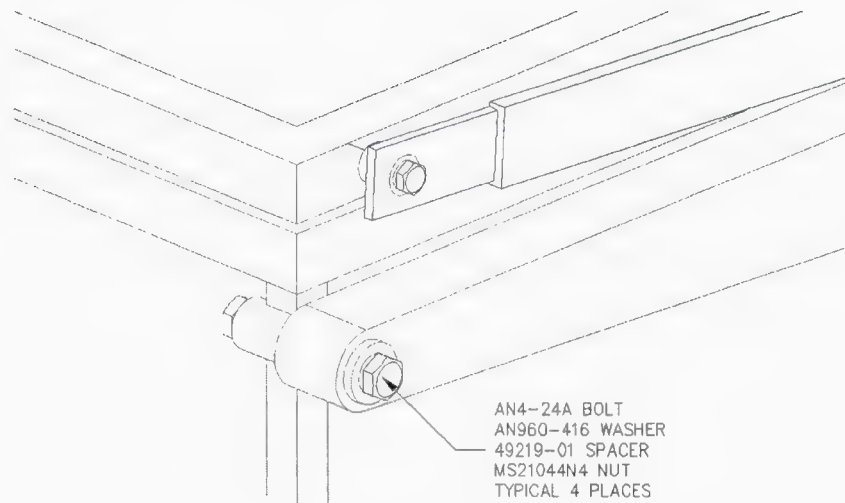


Figure 2.4 Attachment of Basket to Beam

The Basket is bolted to the beams with AN4 bolts (Figure 2.4).

Installation shall be performed to the standards described in AC43.13-1B, Chapter 7, Aircraft Hardware, Control Cables, and Turnbuckles.

Removal of the Cargo Basket is the reverse of the installation. The rotorcraft may be flown without the Cargo Basket and only the External Attachment Provisions installed.

See the Rotorcraft Maintenance Manual for more information on the removal and installation of the landing gear fittings.

3.0 INSPECTION PROCEDURES

3.1 Basket

- Visually inspect tube-to-tube welds and mesh- to-tube welds every 100 hours for cracks, corrosion or other damage.
- Visually inspect basket mesh for damage every 100 hours.

3.2 Beams

- Visually inspect beams attaching basket to the helicopter every 100 hours in situ for cracks, corrosion or other damage.
- Visually inspect bolts attaching the basket to the beams every 100 in situ hours for security and damage.
- Visually inspect bolts attaching beams to external attachment provisions every 100 hours in situ for security and damage.

3.3 External Attachment Provisions

- Visually inspect fittings every 100 hours for cracks, corrosion or other damage.
- Visually inspect hardware attaching fittings and hardware attaching cross-tubes to fitting, every 100 hours in situ for security and damage.

4.0 REPAIR PROCEDURES

4.1 Basket

Repair Basket in accordance with AC43.13-1B, Chapter 4, Section 5, Welding, as required, where mesh-to-tube or tube-to-tube welds have come apart.

Basket is fabricated from the following materials:

Lid and Rim:	$\frac{3}{4}$ " x 0.035" square 4130 steel tube
Frames:	$\frac{1}{2}$ " x 0.035" square 4130 steel tube
Mesh:	$\frac{3}{4}$ " 18 ga. (0.040") expanded carbon steel mesh

Touch up with epoxy paint as required following repairs.

4.2 Beams

DO NOT REPAIR DAMAGE TO BEAMS IF BEYOND THE LIMITS BELOW.

- (a) Nicks and/or gouges on the top or bottom face up to 0.030" deep and 0.125" wide may be dressed out to a smooth contour.
- (b) Nicks and/or gouges on the side faces up to 0.060" deep and 0.125" wide may be dressed out to a smooth contour.
- (c) Nicks on the corners up to 0.125" deep may be dressed out.
- (d) For elongation of basket attachment holes (AN4 bolt):
 - 1. Ream hole to 0.375 (+0.0005/-0.0000)
 - 2. Insert NAS76A4-100 bushing
- (e) For elongation of helicopter attachment holes (AN6 bolt):
 - 1. Ream hole to 0.5000 (+0.0005/-0.0000)
 - 2. Insert NAS76A6-100 bushing
- (f) Touch up paint as required following repairs.

4.3 Landing Gear Attachment Fittings

DO NOT REPAIR DAMAGE TO FITTINGS IF BEYOND THE LIMITS BELOW.

- (a) Nicks and/or gouges on any face up to 0.030" deep and 0.125" wide may be dressed out to a smooth contour. Touch up paint as required.
- (b) Do not repair elongation of provision bolt hole (AN6 bolt). Hole is nominally 0.391" in diameter with 1/4" maximum freedom of motion left and right.
- (c) Do not repair elongation of barrel nut hole. Hole is nominally 3/4" in diameter.

5.0 LIMITATIONS

No overhaul time limitations or airworthiness limitations are applicable to the Cargo Basket or the External Attachment Provisions.

AERO DESIGN LTD.

2013 – 39th Ave N. E., Calgary, Alberta, T2E 6R7

aerodesign@telusplanet.net

F A X C O V E R S H E E T

DATE: July 19, 2004

TIME: 10:10 AM

TO: **Malcolm Stewart**

PHONE: 292-5274

Transport Canada M&M

FAX: 292-4992

FROM: S. Fahey
Aero Design Ltd.

PHONE: 403-250-8027

FAX: 403-250-8333

Number of pages including cover sheet: 2

RE: MSI 53 APPENDIX A FORM

Malcolm,

I have created a "checklist" following the format from Appendix A as best I can. Please review and approve if you find the maintenance instructions adequately support the Cargo Basket Installation.

Steve

MSI 53 - Appendix A

Supplemental ICA Compliance Check Sheet

19 July, 2004

Block 1	Applicant for design change approval: AERO Design Ltd. Description of the design change: Installation of a Cargo Basket on Bell 206L series and 407 Certification Basis of design change: TCDS H-92. FAR part 27, October 2, 1964 Amdt. 27-1 thru 27-30 Program showing how changes to supplemental ICA will be distributed (CAR Standard H525.1(c)): As specified within Maintenance Instruction documents MI 606.01, MI 493.01, MI 492.01			
Block 2	Column 1		Column 2 ICA references	Column 3 Supplemental ICA references
	FAR 27 A27.1(a)	Preparation		Documents MI 606.01, MI 493.01, MI 492.01
	FAR 27 A27.1(b)	Interface		Documents applicable to Cargo Basket Installation.
	FAR 27 A27.1(c)	Changes		Changes controlled by full revision of documents. Distributed i.a.w. AWM 513.1.
	FAR 27 A27.2(a)	Format – Manuals		Documents formatted as manuals
	FAR 27 A27.2(b)	Format – Arrangement		Instructions arranged in manuals step-by-step
	FAR 27 A27.3(a)1	Introduction		Section 1.0, Introduction
	FAR 27 A27.3(a)2	Description	Bell 206L series and 407 Standard Procedures Manual BHT-ALL-SPM	Section 2.0, Description of Cargo Basket
	FAR 27 A27.3(a)3	Control & Operation		Operation of Cargo Basket is obvious
	FAR 27 A27.3(a)4	Servicing		No servicing is required.
	FAR 27 A27.3(b)1	Scheduled Maintenance		Bell 206L series and 407 Maintenance Manuals BHT-206L-MM BHT-407-MM	Section 3.0, Inspection of Cargo Basket coincides with existing 100-hour inspection of rotorcraft.
	FAR 27 A27.3(b)2	Troubleshooting	Not applicable	
	FAR 27 A27.3(b)3	Removal / Replacement	Bell 206L series and 407 Component Repair and Overhaul Manuals BHT-206L-CR&O BHT-407-CR&O	Section 2.0, Description includes instructions on removal and replacement of Cargo Basket.
	FAR 27 A27.3(b)4	Testing/weighing/storage		Not applicable.
	FAR 27 A27.3(c)	Access Plates		All components are accessible.
	FAR 27 A27.3(d)	Special Inspections		Not applicable.
	FAR 27 A27.3(e)	Protective Treatments		Section 4.0 Repair includes instruction to replace paint following repair.
	FAR 27 A27.3(f)	Fasteners		Section 2.0 Description refers installer to drawings and Bell maintenance documents where appropriate fastener info. is found.
	FAR 27 A27.3(g)	Special Tools		No special tools are required.
	FAR 27 A27.4	Airworthiness Limitations		Not applicable.

Airworthiness Limitations differ from other maintenance tasks, in that they are mandatory, as a direct condition of the approval of the type design. They are therefore referenced directly in the approval document itself. However, they must also be included in the Supplemental Instructions for Continued Airworthiness.

Block 3	The change in type design is adequately supported by existing ICA and/or supplemental ICA, as identified above.		
	Signature: _____	Date: _____	Design Approval Number SH00-48

AERO Design Ltd.

**MAINTENANCE INSTRUCTIONS
MI 606.01**

Cargo Basket and External Attachment Provisions

Bell 407 Helicopter

STC # SH00-48

Prepared by: Jeff Clarke

Revision 1, 16 July, 2004

This Maintenance Instruction document has been completely revised (16 July, 2004) and is accepted by Transport Canada, superseding MI 606.01 Revision 0, (20 April, 2004).

AERO Design Ltd.:	Mailing Address: 2013 – 39 th Avenue N E, Calgary Alberta T2E 6R7
	Telephone: (403) 250-8027; Facsimile: (403) 250-8333
	E-Mail aerodesign@telusplanet.net

NOTICE: This manual contains information and data which is proprietary to AERO DESIGN LTD. This manual, or any part thereof, may not be reproduced, copied, duplicated or used without the written consent of AERO Design Ltd.

1.0 INTRODUCTION

The Cargo Basket mounts to the side of the Bell 407 helicopter, supported by two beams bolted to the External Attachment Provisions that replace the landing gear fittings. The Cargo Basket may face the Starboard or Port sides of the helicopter.

2.0 DESCRIPTION

External Attachment Provisions are installed on the Bell 407 in accordance with Installation Drawing 60602. The forward landing gear fittings are replaced with two similar fittings that incorporate provisions for mounting the basket. Smaller blocks are attached inside the cavity in the aft fittings for mounting the aft end of the basket.

The Cargo Basket is installed on the Bell 407 helicopter in accordance with Installation Drawing 60601. The appropriate beams are bolted to the External Attachment Provisions with AN6 bolts (torqued to 90-110 in*lb), secured with barrel nuts inside the fittings. The Basket is bolted to the beams with AN4 bolts.

Installation shall be performed to the standards described in AC43.13-1B.

Removal of the Cargo Basket is the reverse of the installation. The rotorcraft may be flown without the Cargo Basket and only the External Attachment Provisions installed.

See the Rotorcraft Maintenance Manual for more information on the removal and installation of the landing gear fittings.

3.0 INSPECTION PROCEDURES

3.1 Basket

- Visually inspect tube to tube welds and mesh to tube welds every 100 hours for cracks, defects or other damage.
- Visually inspect basket mesh for damage every 100 hours.

3.2 Beams

- Visually inspect beams attaching basket to the helicopter every 100 hours for cracks, defects or other damage.
- Visually inspect bolts attaching the basket to the beams every 100 hours for security and damage.
- Visually inspect bolts attaching beams to external attachment provisions every 100 hours for security and damage.

3.3 External Attachment Provisions

- Visually inspect fittings every 100 hours for cracks, defects or other damage.
- Visually inspect hardware attaching fittings to helicopter, and hardware attaching cross-tubes to fitting, every 100 hours for security and damage.

4.0 REPAIR PROCEDURES

4.1 Basket

Basket is fabricated from the following materials:

- Lid and Rim: $\frac{3}{4}$ " x 0.035" square 4130 steel tube
- Frames: $\frac{1}{2}$ " x 0.035" square 4130 steel tube
- Mesh: $\frac{3}{4}$ " 18 ga. (0.040") expanded carbon steel mesh

Repair in accordance with AC43.13-1B, Chapter 4, as required.

4.2 Beams

DO NOT REPAIR MAJOR DAMAGE TO BEAMS. Replace beam if major damage is found.

- (a) Nicks and/or gouges on the top or bottom face up to 0.030" deep and 0.125" wide may be dressed out to a smooth contour.
- (b) Nicks and/or gouges on the side faces up to 0.060" deep and 0.125" wide may be dressed out to a smooth contour.
- (c) Nicks on the corners up to 0.125" deep may be dressed out.
- (d) For elongation of basket attachment holes (AN4 bolt):
 1. Ream hole to 0.375 (+0.0005/-0.0000)
 2. Insert NAS76A4-100 bushing
- (e) For elongation of helicopter attachment holes (AN6 bolt):
 1. Ream hole to 0.5000 (+0.0005/-0.0000)
 2. Insert NAS76A6-100 bushing
- (f) Touch up paint as required following repairs.

4.3 Landing Gear Attachment Fittings

DO NOT REPAIR MAJOR DAMAGE TO FITTINGS. Replace External Attachment Fittings if major damage is found.

- (a) Nicks and/or gouges on any face up to 0.030" deep and 0.125" wide may be dressed out to a smooth contour. Touch up paint as required.
- (b) Do not repair elongation of provision bolt hole (AN6 bolt). Hole is nominally 0.391" in diameter with 1/4" maximum freedom of motion left and right.
- (c) Do not repair elongation of barrel nut hole. Hole is nominally 3/4" in diameter.

5.0 LIMITATIONS

No overhaul time limitations or airworthiness limitations are applicable to the Cargo Basket or the External Attachment Provisions.

AERO Design Ltd.

**MAINTENANCE INSTRUCTIONS
MI 492.01**

External Cargo Basket

Bell 206L Series

STC # SH00-48

Prepared by: Jeff Clarke

Revision 2, 16 July, 2004

This Maintenance Instruction document has been completely revised (16 July, 2004) and is accepted by Transport Canada, superseding MI 492.01 Revision 1, (12 July, 2002).

AERO Design Ltd.: Mailing Address: 2013 – 39th Avenue N E, Calgary Alberta T2E 6R7
Telephone: (403) 250-8027; Facsimile: (403) 250-8333
E-Mail aerodesign@telusplanet.net

NOTICE: This manual contains information and data which is proprietary to AERO DESIGN LTD. This manual, or any part thereof, may not be reproduced, copied, duplicated or used without the written consent of AERO Design Ltd.

1.0 INTRODUCTION

The Cargo Basket mounts to the side of the helicopter, supported by two beams bolted to the External Attachment Provisions that replace the landing gear fittings. The Cargo Basket may face the Starboard or Port sides of the helicopter.

2.0 DESCRIPTION

The Cargo Basket is installed on the Bell 206L series helicopter in accordance with Installation Drawing 49201. The appropriate beams are bolted to the External Attachment Provisions with AN6 bolts (torqued to 90-110 in*lb), secured with barrel nuts inside the fittings. The Basket is bolted to the beams with AN4 bolts.

Installation shall be performed to the standards described in AC43.13-1B.

Removal of the Cargo Basket is the reverse of the installation. The rotorcraft may be flown without the Cargo Basket and only the External Attachment Provisions installed.

See the Rotorcraft Maintenance Manual and MI 493.01 for information on removal and installation of the landing gear fittings.

3.0 INSPECTION PROCEDURES

3.1 Basket

- Visually inspect tube to tube welds and mesh to tube welds every 100 hours for cracks, defects or other damage.
- Visually inspect basket mesh for damage every 100 hours.

3.2 Beams

- Visually inspect beams attaching basket to the helicopter every 100 hours for cracks, defects or other damage.
- Visually inspect bolts attaching the basket to the beams every 100 hours for security and damage.
- Visually inspect bolts attaching beams to external attachment provisions every 100 hours for security and damage.

3.3 External Attachment Provisions

- Visually inspect fittings every 100 hours for cracks, defects or other damage.
- Visually inspect hardware attaching fittings to helicopter, and hardware attaching cross-tubes to fitting, every 100 hours for security and damage.

4.0 REPAIR PROCEDURES

4.1 Basket

Basket is fabricated from the following materials:

- Lid and Rim: $\frac{3}{4}$ " x 0.035" square 4130 steel tube
- Frames: $\frac{1}{2}$ " x 0.035" square 4130 steel tube
- Mesh: $\frac{3}{4}$ " 18 ga. (0.040") expanded carbon steel mesh

Repair in accordance with AC43.13-1B, Chapter 4, as required.

4.2 Beams

DO NOT REPAIR MAJOR DAMAGE TO BEAMS. Replace beam if major damage is found.

- (a) Nicks and/or gouges on the top or bottom face up to 0.030" deep and 0.125" wide may be dressed out to a smooth contour.
- (b) Nicks and/or gouges on the side faces up to 0.060" deep and 0.125" wide may be dressed out to a smooth contour.
- (c) Nicks on the corners up to 0.125" deep may be dressed out.
- (d) For elongation of basket attachment holes (AN4 bolt):
 - 1. Ream hole to 0.375 (+0.0005/-0.0000)
 - 2. Insert NAS76A4-100 bushing
- (e) For elongation of helicopter attachment holes (AN6 bolt):
 - 1. Ream hole to 0.5000 (+0.0005/-0.0000)
 - 2. Insert NAS76A6-100 bushing
- (f) Touch up paint as required following repairs.

4.3 Landing Gear Attachment Fittings

See Maintenance Instructions MI 493.01 for repair of External Attachment Provisions.

5.0 LIMITATIONS

No overhaul time limitations or airworthiness limitations are applicable to the Cargo Basket.

AERO Design Ltd.

**MAINTENANCE INSTRUCTIONS
MI 493.01**

External Attachment Provisions

Bell 206L Series

STC # SH00-48

Prepared by: S. Fahey

Revision 1: 16 July, 2004

This Maintenance Instruction document has been completely revised (16 July, 2004) and is accepted by Transport Canada, superseding MI 493.01 Revision 0, (12 July, 2002).

AERO Design Ltd.:	Mailing Address: 2013 – 39 th Avenue N E, Calgary Alberta T2E 6R7
	Telephone: (403) 250-8027; Facsimile: (403) 250-8333
	E-Mail: aerodesign@telusplanet.net

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1.0 INTRODUCTION

The existing fittings which mount the helicopter on the landing gear cross tubes are replaced. The new fittings incorporate provisions for attaching external equipment to the helicopter. The External Attachment Provisions are intended for installation of an External Cargo Basket to the side of the helicopter, however Transport Canada approval may be issued for installation of other equipment.

2.0 DESCRIPTION

The External Attachment Provisions are installed on the Bell 206L series helicopter in accordance with Installation Drawing 49301. Each fitting is bolted to the lower fuselage and landing gear with the same fasteners as used for the original fittings.

Installation shall be performed to the standards described in AC43.13-1B.

Removal of the External Attachment Provisions from the helicopter is the reverse of the installation. See the Rotorcraft Maintenance Manual for information on removal and installation of the landing gear fittings.

3.0 INSPECTION PROCEDURES

- Visually inspect fittings every 100 hours for cracks, defects or other damage.
- Visually inspect hardware attaching fittings to helicopter, and hardware attaching cross-tubes to fitting, every 100 hours for security and damage.

4.0 REPAIR PROCEDURES

DO NOT REPAIR MAJOR DAMAGE TO FITTINGS. Replace External Attachment Fittings if major damage is found.

- (a) Nicks and/or gouges on any face up to 0.030" deep and 0.125" wide may be dressed out to a smooth contour. Touch up paint as required.
- (b) Do not repair elongation of provision bolt hole (AN6 bolt). Hole is nominally 0.391" in diameter with 1/4" maximum freedom of motion left and right.
- (c) Do not repair elongation of barrel nut hole. Hole is nominally 3/4" in diameter.

5.0 LIMITATIONS

No overhaul time limitations or airworthiness limitations are applicable to the External Attachment Provisions.

AERO DESIGN LTD.

2013 – 39th Ave N. E., Calgary, Alberta, T2E 6R7

aerodesign@telusplanet.net

F A X C O V E R S H E E T

DATE: July 16, 2004

TIME: 1:40 PM

TO: **Dave McNabb**

PHONE: 292-5008

Transport Canada M&M

FAX: 292-4992

FROM: S. Fahey
Aero Design Ltd.

PHONE: 403-250-8027

FAX: 403-250-8333

Number of pages including cover sheet: 5

RE: SH00-48 CARGO BASKET STC

Dave,

I'm including some background info so that you have a point of reference when reviewing the ICA's. Enclosed are copies of the current STC (issue 2) and the proposed STC (issue 3).

Steve



Transport Canada

Transports Canada

Department of Transport

*Supplemental Type Certificate***This approval is issued to:**

Aero Design Ltd.
1045 McTavish Road, N.E.
Calgary, ALBERTA
T2E 7G9 CANADA

Number: SH00-48**Issue No.:** 2**Approval Date:** December 8, 2000**Issue Date:** June 27, 2002**Responsible Office:**

Prairie and Northern

Aircraft/Engine Type or Model:

BELL 206L, 206L 1, 206L 3, 206L 4, 407

Canadian Type Certificate or Equivalent:

H-92

Description of Type Design Change:

Installation of an Aero Design Ltd right hand cargo
basket/external attachment provisions.

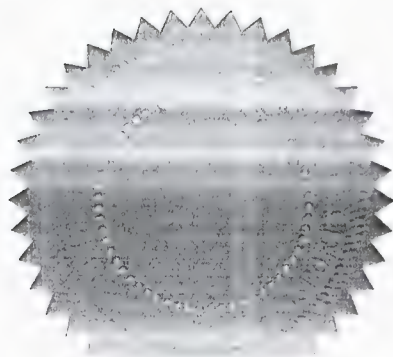
**Installation/Operating Data,
Required Equipment and Limitations:****Bell 407 only:**

Installation of Aero Design Ltd starboard cargo basket is to be done in accordance with Transport Canada approved, Aero Design Ltd., Document Control List DCL 362, Rev. 2, dated 23 November 2000, or later approved revision.

Transport Canada approved Aero Design Ltd, Flight Manual Supplement FMS 362.01 Revision 1, dated 14 November 2000 is required with this installation.

(see continuation sheet)

Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated **will not** adversely affect the airworthiness of the modified product.



D.S. Austen
For Minister of Transport

NOTE: THIS ADDENDUM SHALL REMAIN PART OF THE CERTIFICATE REFERRED TO THEREIN.

Bell 407 only (continued)

Aero Design Ltd Maintenance Manual Supplement MMS 362.01, Revision 0, dated 15 November 2000 is required with this installation.

Applicable placard required on the basket lid in accordance with installation drawing 36201.

Bell 206L, L-1, L-3, L-4, only:

Configuration A - External Attachment Provisions only:

Installation of the External Attachment Provisions is to be completed in accordance with Transport Canada approved, Aero Design Ltd., Document Control List DCL 493, Rev. 2, dated 25 June 2002 or later approved revision.

Transport Canada approved Aero Design Ltd, Flight Manual Supplement FMS493.01, dated 19 May 2002, is required with this installation.

Configuration B - Starboard Cargo Basket installation:

Installation of configuration A, External Attachment Provisions is a prerequisite for installation of configuration B, starboard Cargo Basket installation. Installation of the cargo basket is to be done in accordance with Transport Canada approved, Aero Design Ltd., Document Control List DCL492, Rev. 1, dated 25 June 2002, or later approved revision. High skid gear is required with the basket installation. Placard required on basket lid.

Transport Canada approved Aero Design Ltd., Flight Manual Supplement FMS 492.01, Rev 1, dated 25 June 2002 is required with this installation.

The basis of certification for the Bell 206L series is as defined by the applicable Type Certificate Data Sheets, plus FAR 27 amendment 27-24.

-- END --



Department of Transport

Supplemental Type Certificate

FOR JACK
STAAL
780-495-7963

This approval issued to:

AERO Design Ltd.
2013 - 39th Avenue NE
Calgary, Alberta
T2E 6R7

Approval Number: SH00-48

Issue Number.: 3

Date of Approval: 8 December, 2000

Date of Issue: 16 July, 2004

Responsible Office: Prairie and Northern

Aircraft / Engine Type: Bell

Model: 206L, L-1, L-3, L-4
407

Registration: All Eligible

Serial No.: All Eligible

Canadian Type Certificate or Equivalent: H-92

Description of Design Change: Installation Of Right Hand Cargo Basket / External Attachment Provisions

Required Equipment and Limitations:

Bell 407 Only:

Configuration A – External Cargo Basket Mounted Above Landing Gear

AERO Design Ltd. Cargo Basket to be completed in accordance with Transport Canada approved, AERO Design Ltd. Document Control List, DCL362, Rev. 2, dated 23 November 2000, or later approved revision. Applicable placard required on basket lid in accordance with installation drawing 36201.

Transport Canada approved AERO Design Ltd. Flight Manual Supplement FMS 362.01, Revision 1, dated 14 November 2000, is required with this installation.

AERO Design Ltd. Maintenance Manual Supplement MMS362.01, Revision 0, dated 15 November 2000, is required with this installation.

Basis of Certification is as defined by the applicable Type Certificate Data Sheets.

(see continuation sheet...)

Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated will not adversely affect the airworthiness of the modified product.

DRAFT

For the Minister of Transport

Continuation Sheet

DRAFT

Approval Number: SH00-48

Issue Number: 3

Date of Approval: 8 December, 2000

Date of Issue: 16 July, 2004

Approval Data (Continued):

NOTE: THIS ADDENDUM SHALL REMAIN PART OF THE CERTIFICATE REFERRED TO THEREIN.

Bell 407 Only (Continued):

Configuration B – External Cargo Basket Mounted Below Landing Gear

Installation of the External Cargo Basket is to be completed in accordance with Transport Canada Approved, AERO Design Ltd., Document Control List DCL606, Revision 1, dated 16 July 2004, or later approved revision. High skid gear is required for the basket installation. Placard is required on the basket lid.

Transport Canada approved, AERO Design Ltd., Flight Manual Supplement FMS 606.01, Revision 0, dated 25 March 2004 is required with this installation.

Transport Canada approved, AERO Design Ltd., Maintenance Instructions MI 606.01, Revision 1, dated 16 July 2004 is required with this installation.

External Attachment Provisions installed in accordance with drawing 60602 may remain installed if the basket installation is removed.

Basis of Certification is as defined by the applicable Type Certificate Data Sheets.

Bell 206L, L-1, L-3, L-4 Only:

Configuration A – External Attachment Provisions Only:

Installation of the External Attachment Provisions is to be completed in accordance with Transport Canada approved, AERO Design Ltd., Document Control List DCL493, Rev. 5, dated 16 July 2004, or later approved revision.

Transport Canada approved, AERO Design Ltd., Flight Manual Supplement FMS 493.01, dated 19 May 2002 is required with this installation.

Transport Canada approved, AERO Design Ltd., Maintenance Instructions MI 493.01, Revision 1, dated 16 July 2004 is required with this installation.

Configuration B – External Cargo Basket Installation:

Installation of Configuration A, External Attachment Provisions, is a prerequisite for installation of Configuration B, External Cargo Basket Installation. Installation of the cargo basket is to be completed in accordance with Transport Canada Approved, AERO Design Ltd., Document Control List DCL492, Revision 4, dated 16 July 2004, or later approved revision. High skid gear is required for the basket installation. Placard is required on the basket lid.

Transport Canada approved, AERO Design Ltd., Flight Manual Supplement FMS 492.01, Revision 1, dated 25 June 2002 is required with this installation.

Transport Canada approved, AERO Design Ltd., Maintenance Instructions MI 492.01, Revision 2, dated 16 July 2004 is required with this installation.

Basis of Certification is as defined by the applicable Type Certificate Data Sheets, plus FAR 27 at amendment 27-24.

Aero Design

From: "Aero Design" <aerodesign@telusplanet.net>
To: <mcnabd@tc.gc.ca>
Sent: Friday, July 16, 2004 1:26 PM
Attach: MI606.01_1.pdf; MI493.01_1.pdf; MI492.01_2.pdf
Subject: Fw: ICA's for the Cargo Baskets

Dave,

Thanks for discussing this. If, as you cautioned, you can't get to this today, I'll look forward to hearing from Malcolm on Monday when he picks this up.

MI 492 is for the Bell 206L series basket only.
 MI 493 is for the landing gear fittings we mount on the 206L for attaching the basket.
 MI 606 applies only to the 407, and combines instructions for the Bell 206L's and the 407.

Call me if you have any questions.

Steven Fahey steve.aerodesign@telusplanet.net
 Aero Design
 2013 - 39 Avenue NE
 Calgary, AB
 T2E 6R7
 ph: 403 250 8027
 fax: 403 250 8333

----- Original Message -----

From: "Aero Design" <aerodesign@telusplanet.net>
 To: "Jack Staal" <STAALJ@tc.gc.ca>
 Sent: Friday, July 16, 2004 12:10 PM
 Subject: ICA's for the Cargo Baskets

> Jack,
 >
 > I have elected not to compile all the documents into one, as it would be
 > difficult to track anything backward afterward. Please review the changes
 > and forward to whoever comes into work at M&M Calgary today. It would be
 > helpful if you could see if anyone is available at your end, just in case.
 >
 > Steven Fahey steve.aerodesign@telusplanet.net
 > Aero Design
 > 2013 - 39 Avenue NE
 > Calgary, AB
 > T2E 6R7
 > ph: 403 250 8027
 > fax: 403 250 8333
 >

Aero Design

From: "Staal, Jack" <STAALJ@tc.gc.ca>
To: "Aero Design" <aerodesign@telusplanet.net>
Sent: Friday, July 16, 2004 10:48 AM
Subject: RE: SH00-48 revision

Steve further to our telecon today, AWM 513.31 refers to distribution of the instructions for continued airworthiness, including subsequent changes.

Cheers

J

-----Original Message-----

From: Aero Design [mailto:aerodesign@telusplanet.net]
Sent: Thursday, July 15, 2004 9:04 AM
To: Staal, Jack
Subject: SH00-48 revision

Hi Jack,

I didn't hear from you yesterday, but I assume you did find some time to look at the changes to the STC. Please let me know what progress you've made.

Steven Fahey steve.aerodesign@telusplanet.net
Aero Design
2013 - 39 Avenue NE
Calgary, AB
T2E 6R7
ph: 403 250 8027
fax: 403 250 8333

Aero Design

From: "Aero Design" <aerodesign@telusplanet.net>
To: <gkearney@omega-aviation.com>
Sent: Friday, July 16, 2004 12:26 PM
Subject: Cargo Basket

Gerry,

I lit the fire and it got his attention, but now the fellow at Transport has thrown me a curve ball. Seems they re-wrote their requirements for supplementary maintenance instructions overnight and I have to dance to their tune. I have to schedule a meeting with yet another official - one who won't be around during the Stampede, of course. I'm sorry, but it's not coming together on your schedule. I will notify you if I can get over this hurdle.

Steven Fahey steve.aerodesign@telusplanet.net
Aero Design
2013 - 39 Avenue NE
Calgary, AB
T2E 6R7
ph: 403 250 8027
fax: 403 250 8333

7/16/04

Aero Design

From: "Aero Design" <aerodesign@telusplanet.net>
To: "Jack Staal" <STAALJ@tc.gc.ca>
Sent: Friday, July 16, 2004 12:10 PM
Attach: MI606.01_1.pdf; MI493.01_1.pdf; MI492.01_2.pdf
Subject: ICA's for the Cargo Baskets

Jack,

I have elected not to compile all the documents into one, as it would be difficult to track anything backward afterward. Please review the changes and forward to whoever comes into work at M&M Calgary today. It would be helpful if you could see if anyone is available at your end, just in case.

Steven Fahey steve.aerodesign@telusplanet.net
Aero Design
2013 - 39 Avenue NE
Calgary, AB
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7/16/04

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Aircraft Maintenance & Manufacturing Staff Instruction

Subject:	Number:	MSI 53
Review of Supplemental Instructions for Continued Airworthiness	Revision No:	1
	Number of Pages:	6
File No: AARP-5009-3-53	Issue Date:	March 24, 2004

1. Purpose

1.1 The purpose of this MSI is to provide a sample compliance check sheet, and to outline the procedures to be used by Transport Canada Civil Aviation (TCCA) personnel or other delegates who are responsible for determining the acceptability of proposed supplemental Instructions for Continued Airworthiness (ICA) for changes to a type design.

2. Definitions

2.1 Instructions for Continued Airworthiness (ICA) means all instructions published by the holder of the design approval for an aeronautical product, that relate to the inspection, maintenance, testing, repair, removal and replacement of that product. Initial installation instructions, Aircraft Flight Manuals and similar documents that relate solely to the operation of the aircraft in flight **do not** form part of the ICA.

2.2 Supplemental ICA means all maintenance instructions published to address changes to the type design of an aeronautical product, by various means, such as Supplemental Type Certificates (STC), Repair Design Approvals (RDA), or Part Design Approvals (PDA). Supplemental ICA complement and in some cases supersede the ICA for the original product.

2.3 For the purposes of this MSI, "applicant" means an individual or a TCCA approved organization, which is seeking a design approval by means of an STC, RDA or PDA.

2.4 For the purposes of this MSI, "reviewer" means either a Design Approval Representative (DAR) or an employee of an Airworthiness Engineering Organization (AEO) or Design Approval Organization (DAO) authorized in accordance with a TCCA approved procedures manual, or an assigned Aircraft Maintenance and Manufacturing Civil Aviation Safety Inspector, who determines the acceptability of ICA proposals in accordance with this MSI.

3. Background

3.1 The basic requirements for ICA and for supplemental ICA are contained in the applicable design standards for the products concerned. As a general rule, the standards that apply to the original type design, also apply to

changes to that design. However, application of the Changed Product Rule will require compliance with the current design standards, which could affect the supplemental ICA.

3.2 The basic standard for compliance, specified in all the applicable requirements, is that ICA be "acceptable to the Minister." This implies a subjective judgment on the part of the Minister or his delegate; therefore, it is incumbent on the Minister to identify the criteria to be used, to ensure standardization. In this case, the basic criteria to be applied have been published in appendices to the various Airworthiness Manual chapters. Some, but not all, of the applicable standards and appendices are listed below.

- a. Normal, Utility, Aerobatic & Commuter
Category Aeroplanes: STD 523.1529 and STD 523 Appendix G
- b. Transport Category Aeroplanes: STD 525.1529 and STD 525 Appendix H
- c. Normal Category Rotorcraft: STD 527.1529 and STD 527 Appendix A
- d. Transport Category Rotorcraft: STD 529.1529 and STD 529 Appendix A
- e. Manned Free Balloons: STD 531.82 and STD 531 Appendix A
- f. Aircraft Engines: STD 533.4 and STD 533 Appendix A
- g. Aircraft Propellers: STD 535.4 and STD 535 Appendix A

4. Responsibility for review of proposed Supplemental ICA

4.1 Proposed supplemental ICA are reviewed as part of the requirement for the approval of the design change. Dependent on the circumstances, the design change approval may be granted either by appropriately delegated persons within Transport Canada, or by external delegates. The person issuing the design approval must ensure that the proposed supplemental ICA have been reviewed and accepted in accordance with this MSI. The following requirements must be met when:

- a. An industry delegate approves the design change, the delegate shall ensure the review and acceptance of proposed supplemental ICA are conducted in accordance with their approved procedures.
- b. A Transport Canada Regional Office approves a design change, the responsible Aircraft Certification Engineer shall ensure that proposed supplemental ICA are reviewed and accepted by a Civil Aviation Safety Inspector, Aircraft Maintenance and Manufacturing. Review and acceptance of proposed supplemental ICA should only be conducted by personnel having appropriate experience with the aircraft category or maintenance specialty concerned, and who have been locally authorized in accordance with regional procedures.
- c. Transport Canada Headquarters approves the design change, the responsible Aircraft Certification Engineer shall ensure that proposed supplemental ICA are reviewed and accepted by Aircraft Evaluation Division of the Aircraft Maintenance and Manufacturing Branch.

4.2 In all cases, the evaluation of proposed supplemental ICA should be conducted and a written confirmation of compliance should be made, in a manner similar to that shown in Appendix A to this MSI. Appendix A provides a sample ICA compliance check sheet, as an example of an acceptable written confirmation of compliance. This example applies to design change approvals having Airworthiness Manual Chapter 525 as their certification basis. Check sheets for changes having another certification basis should reflect the equivalent requirements of the appropriate standard.

4.3 The person approving the design change must ensure that the evaluation of the proposed supplemental ICA has been completed as

outlined in this MSI, and must ensure that the details of the supplemental ICA (or fact that no supplemental ICA apply) are referenced in the approved section of the design approval documentation. The entry shall distinguish between Airworthiness Limitations, which are mandatory as a condition of type approval, and manufacturer's recommendations, which are non-mandatory. Proposed supplemental ICA shall be listed under the appropriate topic headings identified on the sample compliance check sheet in Appendix A.

5. Review Procedure

5.1 The person approving a design change must first verify whether the change is adequately supported by the existing ICA. If the existing ICA proves to be adequate, this fact should be confirmed on the compliance check sheet by the reviewer, and entered on the approved section of the design approval documentation itself, when issued. If proposed supplemental ICA is required, this must be recorded on the ICA compliance check sheet, and identified on the approved section of the design approval documentation. The intent of listing the proposed supplemental ICA in the approved section of the design approval documentation is to ensure that persons incorporating the design change are aware of all related ICA requirements, in order to make the necessary entries in the aircraft technical records. If no proposed supplemental ICA is required, it is equally important to provide positive confirmation of this fact, on the approved section of the design approval documentation.

5.2 It is not intended that ICA be developed unnecessarily. Many design changes may involve no supplemental ICA at all. This is particularly true of scheduled maintenance ICA. For example, the existing zonal program or general area inspection instructions may adequately cover many structural changes. In such cases, a simple indication that the original ICA are unaffected by the design change will suffice.

5.3 Appendix A to this MSI is a sample supplemental ICA compliance check sheet, made up of three blocks, one of them (Block 2) containing three columns:

- a. **Block 1** identifies the applicant requesting the design change approval, the design change concerned, the certification basis (including revision amendment) to which the change will be approved and a program for distribution and amendment of any supplemental ICA.
- b. **Block 2 column 1** identifies the topic headings from the design standard, which will be used to define the Supplemental ICA requirement applicable to the design change.
- c. **Block 2 column 2** identifies the ICA documentation published by the holder of the original type design, as it applies to the particular topic heading in column 1.
- d. **Block 2 column 3** identifies the applicable part(s) of the supplemental ICA documentation developed by the applicant, to show compliance with the respective topic in column 1.
- e. **Block 3** provides space for a statement and signature by the reviewer attesting that the existing ICA; Supplemental ICA; or combination of both, as identified in Block 2, columns 2 and 3 are adequate to support the design change.

5.4 The applicant for a design change approval will provide information conforming to the following:
(refer to Appendix A):

- a. In **Block 1**, enter the applicant's name, a brief description of the design change, the certification basis, the certification basis revision,

and a description of the program for distribution and amendment of the supplemental ICA.

- b. In **Block 2, column 1**, No entry required.
- c. In **Block 2, column 2**, identify the ICA documentation published by the holder of the original type design, which are applicable to the respective topic heading in column 1.
- d. In **Block 2, column 3**, where applicable, identifies the supplemental ICA developed to show compliance with the respective topic in column 1. If no supplemental ICA are required for the respective topic in column 1, enter "N/A."

5.5 The reviewer will:

- a. Verify all columns for completeness.
- b. assess the applicant's disposition of columns 2 and 3.
- c. assess the referenced section(s) of the proposed supplemental ICA contained in the accompanying documentation for compliance with the requirements of the certification basis. The format of the proposed supplemental ICA should be compatible with that of the original ICA.

Note: With reference to the changes to the type design, review the initial installation instructions provided with the STC, in order to understand the extent of the modification and the adequacy of the proposed supplemental ICA.

- d. assess the proposed distribution and amendment system for the supplemental ICA.

Note: *The means of compliance with this requirement will vary with the nature of the approval. With STCs, the information on the certificate itself may suffice to identify the supplemental ICA, which could be contained in an attached data sheet. In the case of PDAs, where the approval document may not accompany the part itself, some other means must be used. One possible method of distribution, which could apply to any type of approval, would be to provide a link to the approval holder's web page, where the applicable supplemental ICA could be accessed on-line.*

- e. ensure that the design approval number is entered, on the supplemental ICA compliance check sheet in Block 3

5.6 If the review shows that the proposed ICA are acceptable to the Minister, the reviewer will sign and date the form in Block 3, and include the completed form with the documentation for the design change.

Note: *The signature confirms that the reviewer has found the reviewed ICA "Acceptable to the Minister." In the event of non-acceptance, the reviewer must advise the applicant in general terms of the nature of the deficiencies.*

6. Effective date

6.1 This instruction comes into effect immediately.

7. HQ Contact

7.1 The responsible officer indicated below may be contacted for information regarding this MSI:

Superintendent, Aircraft Evaluation (AARPG)

Aircraft Maintenance & Manufacturing
Phone: (613) 952-4384
Facsimile: (613) 952-3298

D.B. Sherritt
Director,
Aircraft Maintenance and Manufacturing

Appendix A

Sample Supplemental ICA Compliance Check Sheet For Transport Category

Block 1

Name of the applicant for the design change approval: _____
Description of the design change: _____ _____
Certification Basis of design change and revision date: _____
Program showing how changes to supplemental ICA will be distributed (CAR Standard H525.1(c)): _____

Block 2

Column 1	Column 2	Column 3
H525.2 (a) (Manual(s))	ICA ref: _____	Supplemental ICA ref: _____
H525.2(b) (Practical arrangement)	ICA ref: _____	Supplemental ICA ref: _____
H525.3 (a) (1) (Introduction)	ICA ref: _____	Supplemental ICA ref: _____
H525.3 (a) (2) (Description)	ICA ref: _____	Supplemental ICA ref: _____
H525.3 (a) (3) (Control & Operation)	ICA ref: _____	Supplemental ICA ref: _____
H525.3 (a) (4) (Servicing)	ICA ref: _____	Supplemental ICA ref: _____
H525.3 (b) (1) (Scheduling)	ICA ref: _____	Supplemental ICA ref: _____
H525.3 (b) (2) (Troubleshooting)	ICA ref: _____	Supplemental ICA ref: _____
H525.3 (b) (3) (Removal/replacement)	ICA ref: _____	Supplemental ICA ref: _____

H525.3 (b) (4) (General)	ICA ref: _____	Supplemental ICA ref: _____
H525.3 (c) (Access)	ICA ref: _____	Supplemental ICA ref: _____
H525.3 (d) (Special inspections)	ICA ref: _____	Supplemental ICA ref: _____
H525.3 (e) (Protective treatment)	ICA ref: _____	Supplemental ICA ref: _____
H525.3 (f) (Fasteners, torque values, etc)	ICA ref: _____	Supplemental ICA ref: _____
H525.3 (g) (Special tools)	ICA ref: _____	Supplemental ICA ref: _____
H525.4 (a) (AWL - Separate Section)	ICA ref: _____	Supplemental ICA ref: _____
H525.4 (a) 1 (Structures)	ICA ref: _____	Supplemental ICA ref: _____
H525.4 (a) 2 (Fuel Tank System)	ICA ref: _____	Supplemental ICA ref: _____
H525.4 (b) (Principal Manual)	ICA ref: _____	Supplemental ICA ref: _____

Airworthiness Limitations differ from other maintenance tasks, in that they are mandatory, as a direct condition of the approval of the type design. They are therefore referenced directly in the approval document itself. However, they must also be included in the Supplemental Instructions for Continued Airworthiness.

Block 3

The change in type design is adequately supported by existing ICA and/or supplemental ICA, as identified above.

Signature: _____ **Date:** _____ **Design Approval Number** _____

Last updated: 2004-05-18

Important Notices

MSI 53

ICA

MI 606.01

- DOES NOT HAVE REMOVAL INSTRUCTIONS
- FASTENER IDENT. / TORQUE VALUES

A DELEGATE CAN SIGN OFF THE CHECKSHEET?

- MAYBE NOT

- IF DELEGATED FOR THE STUFF

- FRED STILL "WORKING THIS OUT" FOR ANOTHER FEW WEEKS

AERO DESIGN LTD.

2013 – 39 Avenue N.E., Calgary, Alberta, T2E 6R7

Tel: 403-250-8027

Fax: 403-250-8333

aerodesign@telusplanet.net

6 July, 2004

Transport Canada
Aircraft Certification Division
11th Floor, Canada Place
9700 Jasper Avenue
Edmonton, Alberta
T5J 4E6

Attn: Jack Staal

Your File # : SH00-48

Our File # : 606

Re: Installation of External Cargo Basket on Bell 407

Jack,

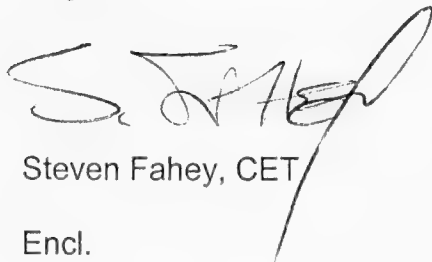
Enclosed are the remaining documents you require.

Compliance Program
AE 100 Form

CP 606
AE 606

Rev. 0
Rev. 0

Regards,

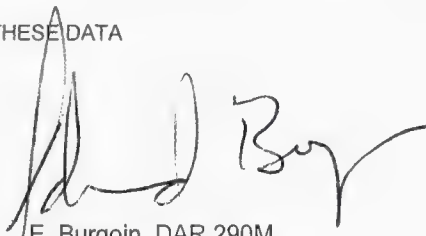
A handwritten signature in black ink, appearing to read 'S. Fahey', with a long, sweeping flourish extending from the end of the signature.

Steven Fahey, CET

Encl.

FORM AE-100

DEPARTMENT OF TRANSPORT STATEMENT OF COMPLIANCE OF AIRCRAFT OR AIRCRAFT COMPONENTS WITH THE AIRWORTHINESS REQUIREMENTS			AE-100 No.: AE606 Initial Issue Date: 06 July, 2004 Revision: 0 Revision Date: Approval No.: SH00-48 Delegation No.: 290M Delegate Name: E. Burgoin Classification of Designee: Employer: AERO Design Ltd.
Aircraft Mfr: Bell Helicopter (Textron) Aircraft Model: 407, 206L Series Registration: All Eligible	Model Type Airplane <input type="checkbox"/> Helicopter <input checked="" type="checkbox"/> Appliance <input type="checkbox"/> Component <input type="checkbox"/>		
LIST OF APPROVED REPORTS AND DATA			
Document Number	Document Title		Compliance Status
DCL606	Revision 0	Document Control List	
DCL492	Revision 3	Document Control List	
DCL493	Revision 4	Document Control List	
ER 606.01	Revision 0	Engineering Report	
ER 606.02	Revision 0	Engineering Report	
ER 492.01	Revision 0	Engineering Report	
ER 492.02	Revision 0	Engineering Report	
ER 493.01	Revision 0	Engineering Report	
MI 606.01	Revision 0	Maintenance Instructions	
60601	Revision 0	Installation Drawing, 407 Basket	
60602	Revision 0	Installation Drawing, 407 Provisions	
60620	Revision 0	Fabrication Drawing	
60621	Revision 0	Fabrication Drawing	
60622	Revision 0	Fabrication Drawing	
60624	Revision 0	Fabrication Drawing	
49301	Revision 2	Installation Drawing	
49311	Revision 2	Fabrication Drawing	
49312	Revision 2	Fabrication Drawing	
49201	Revision 1	Installation Drawing	
49205	Revision 1	Fabrication Drawing	
49207	Revision 1	Fabrication Drawing	
49208	Revision 1	Fabrication Drawing	
49209	Revision 1	Fabrication Drawing	
49210	Revision 1	Fabrication Drawing	
49211	Revision 1	Fabrication Drawing	
49212	Revision 0	Fabrication Drawing	
49213	Revision 1	Fabrication Drawing	
49214	Revision 0	Fabrication Drawing	
49215	Revision 0	Fabrication Drawing	
49216	Revision 0	Fabrication Drawing	
49217	Revision 1	Fabrication Drawing	
49218	Revision 1	Fabrication Drawing	
49219	Revision 0	Fabrication Drawing	
49221	Revision 1	Fabrication Drawing	

36255	Revision 1	Fabrication Drawing	
36261	Revision 1	Fabrication Drawing	
36262	Revision 1	Fabrication Drawing	
36271	Revision 0	Fabrication Drawing	
36272	Revision 0	Fabrication Drawing	
36273	Revision 0	Fabrication Drawing	
36274	Revision 0	Fabrication Drawing	
36275	Revision 1	Fabrication Drawing	
36276	Revision 0	Fabrication Drawing	
36277	Revision 0	Fabrication Drawing	
36278	Revision 1	Fabrication Drawing	
36280, Sht 1	Revision 2	Fabrication Drawing	
36280, Sht 2	Revision 2	Fabrication Drawing	
Document Number or Date		DATA APPROVED BY TRANSPORT CANADA	
23 June, 04 23 June, 04 23 June, 04		Flight Test Report – Cargo Basket on LHS Flight Test Report – Cargo Basket on RHS Flight Test Report – Relative Stick Positions	
FMS 606.01 FMS 493.01 FMS 492.01	Revision 0 Revision 0 Revision 1	Flight Manual Supplement Flight Manual Supplement Flight Manual Supplement	Approved Approved
<p style="text-align: center;">CERTIFICATION</p> <p>UNDER THE AUTHORITY VESTED IN ME BY THE DEPARTMENT OF TRANSPORT, I HEREBY CERTIFY THAT THE DATA LISTED ABOVE ON THE SHEETS 1 AND 2 HAVE BEEN EXAMINED IN ACCORDANCE WITH ESTABLISHED PROCEDURES AND FOUND TO COMPLY, TO THE BEST OF MY KNOWLEDGE AND BELIEF WITH THE PERTINENT COMPLIANCE REQUIRMENTS.</p> <p>I THEREFORE <input type="checkbox"/> RECOMMEND FOR APPROVAL OF THESE DATA <input checked="" type="checkbox"/> APPROVE THESE DATA</p> <div style="text-align: right;">  E. Burgoin, DAR 290M </div>			

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

APPLICANT: AERO Design Ltd.
2013 39th Avenue NE
Calgary, Alberta, T2E 6R7

DATE: 29 March, 2004
REV. No. 0

CORRESPONDANCE TO:
(If other than applicant)

MAKE: Bell Helicopter
MODEL: 407

REGISTRATION: All Applicable
SERIAL No.: All Applicable

NATURE OF WORK: Installation of Side-Mounted External Cargo Basket

MODEL CERTIFICATION BASIS: FAR 27, Amendment 27-30, with exceptions as noted below.

MODIFICATION CERTIFICATION BASIS: FAR 27, Amendment 27-30, with exceptions as noted below.

Airworthiness Requirement	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
Paragraph	Amdt.				
Subpart B – Flight					
27.27	30	Centre of Gravity Limits	N/A		X <i>JB</i> No change from Type Approval.
27.29	30	Empty Weight and Corresponding C of G	Data specified on inst'n drawing		
27.51	30	Takeoff	Flight Test	X	Flight tests performed using the same basket on Bell 206L and similar basket on Bell 407 to satisfy the flight test requirements. Limitations established in previous flight tests to be used with this installation.
27.65	30	Climb: All Engines Operating	Flight Test	X	
27.71	30	Gliding Performance	Flight Test	X	
27.75	30	Landing	Flight Test	X	
27.141	30	Flight Characteristics – General	Flight Test	X	
27.143	30	Controllability and Maneuverability	Flight Test	X	
27.151	30	Flight controls	Flight Test	X	
27.161	30	Trim	Flight Test	X	
27.171	30	Stability – General	Flight Test	X	
27.173	1	Longitudinal Stability	Flight Test	X	
27.175	1	Demonstration of Longitudinal Stability	Flight Test	X	
27.177	30	Static Directional Stability	Flight Test	X	
27.241	30	Ground Resonance	Flight Test	X	
27.251	30	Vibration	Flight Test	X	

Subpart C – Strength Requirements

27.301	30	Loads – Air Drag Loads	Analysis	X	<i>JB</i>
27.301	30	Loads – Inertia Loads	Compliance with 27.337 and 27.561	X	

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

Airworthiness Requirement	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
Paragraph	Amdt.				
27.303	30	Factor of Safety		X	
27.305	30	Strength and Deformation		X	
27.307	30	Proof of Structure		X	
27.337(a)	30	Limit Maneuvering Load Factor – Positive		X	
27.471	30	Ground Loads - General	X		Critical load factor in downward direction. Landing gear loads on fitting to be assessed by comparison with ultimate strength of original Type Approved fitting, and test as required. No change to assumptions used for Type Approved configuration
27.473	30	Ground Loading Conditions and Assumptions			
27.501	30	Ground Loading Conditions – Landing Gear with Skids	X		Loads from the cargo basket on the landing gear fittings do not use skid tubes or cross tubes in load path.
27.547	30	Main Rotor Structure	X		See comments for flight test above
27.561	30	Emergency Landing Conditions		X	
27.561(b)3(i)	24	Emergency Landing Conditions – Up		X	
27.561(b)3(ii)	24	Emergency Landing Conditions – Fwd			Forward deflection or failure of basket poses no threat to occupants.
27.561(b)3(iii)	24	Emergency Landing Conditions – Side		X	
27.561(b)3(iv)	24	Emergency Landing Conditions – Down		X	27.337 Maneuvering Load is Critical.

Subpart D – Design and Construction

27.601	30	Design		X	Design is conventional.
27.603	30	Materials		X	Materials used are specified in Mil-Hdbk-5H.
27.605	30	Fabrication Methods		X	Design is conventional.
27.609	30	Protection of Structure		X	
27.611	30	Inspection Provisions		X	Design is easy to inspect.
27.613	30	Material Strength Properties and Design Values		X	
27.625	30	Fitting Factor		X	
27.725	30	Limit Drop Test			Ref. TCDS Equivalent Safety Finding. Landing gear loads on fitting to be assessed by comparison with ultimate strength of original Type Approved fitting, and test as required.
27.727	30	Reserve Energy Absorption Drop Test			Installation does not block doors.
27.783	30	Doors			
27.787(a)	30	Cargo and Baggage Compartments		X	
27.787(b)	30	Cargo and Baggage Compartments		X	Basket is a closed container.
27.787(c), (d)	30	Cargo and Baggage Compartments			Cargo is external to helicopter.

Airworthiness Requirement	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
Paragraph	Amdt.				
27.807	30 Emergency Exits	N/A		X	Installation does not block doors.
27.865(a)	30 External Load Attaching Means	Compliance with 27.337		X	
27.865(b), (c)	30 External Load Attaching Means	N/A			
27.865(d)	30 External Load Attaching Means	N/A			Failure of an attachment does not endanger the rotorcraft.
27.1387	30 Position Light System Dihedral Angles	N/A			
27.1401	30 Anticollision Light System	Statement		X	No change from Type Approval. Light located at FS 396, WL 130 on vertical fin. Basket has no significant effect on visibility of anticollision light.

Subpart G – Operating Limitations and Information

27.1505	30 Never Exceed Speed	Flight Test, Flight Manual Supplement		X	V _{NE} limits as specified in the existing Flight Manual (140 kts.)
27.1525	30 Kinds of Operation	Flight Manual Supplement		X	Limited to VFR only.
27.1529	30 Instructions for Continuing Airworthiness	Maintenance Instructions		X	Maintenance instructions provided
27.1557(a)	30 Miscellaneous Markings and Placards – Baggage Compartments	Placard		X	
27.1557(b)	30 Miscellaneous Markings and Placards	N/A			
27.1557(c)	30 Miscellaneous Markings and Placards	N/A			
27.1557(d)	30 Miscellaneous Markings and Placards	N/A			
27.1581	30 Rotorcraft Flight Manual – General	Flight Manual Supplement		X	
27.1583(c)	30 Operating Limitations – Weight and Loading Information	Flight Manual Supplement		X	
27.1585	30 Operating Procedures	Flight Manual Supplement		X	
27.1587	30 Performance Information	Flight Manual Supplement		X	
27.1589	30 Loading Information	Flight Manual Supplement & Placard		X	Placard installed on basket lid

Airworthiness Manual Requirements

527.1581(e)	Rotorcraft Flight Manual – Units	SI and Imperial Units provided in Flight Manual Supplement		X	
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AERO DESIGN LTD.

2013 – 39 Avenue N.E., Calgary, Alberta, T2E 6R7

Tel: 403-250-8027
Fax: 403-250-8333
aerodesign@telusplanet.net

29 June, 2004

Transport Canada
Aircraft Certification Division
11th Floor, Canada Place
9700 Jasper Avenue
Edmonton, Alberta
T5J 4E6

FAXED
JUN 30 2004

Attn: Jack Staal

Your File # : SH00-48
Our File # : 606

Re: Installation of External Cargo Basket on Bell 407

Jack,

Enclosed are the flight test results for the Bell 407 with the Cargo Basket fitted to the Left and Right-Hand sides.

Flight Test Report – Cargo Basket on LHS	1 page
Flight Test Report – Cargo Basket on RHS	1 page
Flight Test Cyclic Stick Positions	1 page
Weight and Balance summary – Baseline & Test Flights	2 pages
Empty Weight Data	2 pages
Flight Permit	2 pages
Application for Flight Permit	1 page

When revising the STC, please remove all references to which side of the helicopter the basket shall be installed. From now on, this will be the choice of the installer.

With the rotorcraft tested to 156 knots, the V_{NE} restriction of 140 knots, already in the FMS, still applies.

Regards,

Steven Fahey, CET

Encl.

Transport Canada Limited or Full STC
Simple External Modification – Applicant's Flight Test Report

Aircraft Type: **Bell 407** Reg. # / Serial #: **G-6FCC 153031**
 Date of Flight: **JUNE 13/04** Location of Flight: **VANCOUVER**
 Takeoff Weight: _____ Takeoff C of G: _____
 Modification Description: **Installation of AERO Design Ltd. External Cargo Basket RIGHT SIDE**
 Modification Drawing #: **60601**
 List all other external mods: **CARGO MIRROR / CARGO HOOR / PROVISION ONLY FOR P-1000
 FLIGHTS / DART BEAR PAWS**

		TEST RESULTS		Initials	
TEST		Characteristics to Look For:		Baseline Flight	Satisfactory With Mod.
1	Low Speed Controllability	- Precise Hovering - Adequate control margins up to 20 MPH estimated airspeed sideward and rearward.		<i>JK</i>	<i>JK</i>
2	Airspeed Indications	- Airspeed and altitude indication reliable and steady. - Location of Modification not near pitot or static ports? Yes <u>No</u> (Circle one)		<i>JK</i>	<i>JK</i>
3	Forward Flight up to V _{NE}	- Determine max. level flight airspeed at MCP. - Control position (margins) and trim characteristics - Conduct turns at V _{NE} both directions - Vibrations - Maximum speed flown: 156 KTS. Note: V _{NE} in Flight Manual Supplement will be 90% of maximum speed flown. Test to 1.1 V _{NE} , with flight permit authority.		<i>JK</i>	<i>JK</i>
4	Autorotation	- Simulated sudden power failures building up from moderate speeds to V _{NE} and autorotation control V _{minROD} and V _{Neuto} 55 KTS 110 KTS.		<i>JK</i>	<i>JK</i>
5	Climbing Flight	- TOP and MCP, speed from (V _Y - 10) kias to 1.3 V _Y - Altitude, airspeed and power control		<i>JK</i>	<i>JK</i>
6	Takeoff and Landing	- Effect on normal procedures and handling		<i>JK</i>	<i>JK</i>
7	Miscellaneous	- System controls, displays and interface - Effect on emergency and normal egress - Flight Manual Supplement for special operating procedures and information - If required, attach to report		<i>JK</i>	<i>JK</i>

I hereby attest that I have flown this **Bell 407**, R/N G-6FCC, S/N 53031 with the above modifications installed and that this aircraft exhibited handling qualities and performance characteristic of a standard **Bell 407** helicopter. Maximum speed attained was **156** IAS. The speed was limited by N/A

Pilot's Signature: *G. Keane* Date: **JUNE 24, 04**
 Pilot's Name: **G. KEANE** Pilot's License #: **AH1045963**

(If applicable) DAR's Signature: *E. Burgoin* Date: **23 JUNE 2004**
 DAR's Name: **E. Burgoin** DAR's Number: **290M**

Transport Canada Limited or Full STC
Simple External Modification – Applicant's Flight Test Report

Aircraft Type: **Bell 407** Reg. # / Serial #: **53031 / 1-655**
 Date of Flight: **23 JUNE 2004** Location of Flight: **WINDY HILL INTL**
 Takeoff Weight: Takeoff C of G:
 Modification Description: **Installation of AERO Design Ltd. External Cargo Basket**
 Modification Drawing #: **60601**
 List all other external mods: **CARGO MIRROR / PROVISION FOR RETRACT FLIGHTS /**
BACK PAWS / CARGO HOOK

		TEST RESULTS		Initials	
TEST		Characteristics to Look For:		Baseline Flight	Satisfactory With Mod.
1	Low Speed Controllability	- Precise Hovering - Adequate control margins up to 20 MPH estimated airspeed sideward and rearward.		<i>OK</i>	<i>OK</i>
2	Airspeed Indications	- Airspeed and altitude indication reliable and steady. - Location of Modification <u>not</u> near pitot or static ports? Yes <u>No</u> (Circle one)		<i>OK</i>	<i>OK</i>
3	Forward Flight up to V _{NE}	- Determine max. level flight airspeed at MCP. - Control position (margins) and trim characteristics - Conduct turns at V _{NE} both directions - Vibrations - Maximum speed flown: 156 KTS Note: V _{NE} in Flight Manual Supplement will be 90% of maximum speed flown. Test to 1.1 V _{NE} , with flight permit authority.		<i>OK</i>	<i>OK</i>
4	Autorotation	- Simulated sudden power failures building up from moderate speeds to V _{NE} and autorotation control V _{min} ROD and V _{Neuro} 55 KTS 110 KTS		<i>OK</i>	<i>OK</i>
5	Climbing Flight	- TOP and MCP, speed from (V _Y – 10) kias to 1.3 V _Y - Altitude, airspeed and power control		<i>OK</i>	<i>OK</i>
6	Takeoff and Landing	- Effect on normal procedures and handling		<i>OK</i>	<i>OK</i>
7	Miscellaneous	- System controls, displays and interface - Effect on emergency and normal egress - Flight Manual Supplement for special operating procedures and information - If required, attach to report		<i>OK</i>	<i>OK</i>

I hereby attest that I have flown this **Bell 407**, R/N **53031**, S/N **22501** with the above modifications installed and that this aircraft exhibited handling qualities and performance characteristic of a standard **Bell 407** helicopter. Maximum speed attained was **156** IAS. The speed was limited by **NIL**

Pilot's Signature: *[Signature]*
 Pilot's Name: **G. GARNIER**

Date: **JUNE 24, 04**
 Pilot's License #: **66100566**

(If applicable) DAR's Signature: *[Signature]*

DAR's Name: **E. Burgoin**

Date: **JUN 23/04**
 DAR's Number: **290M**

Bell 407**Cargo Basket Installation**

(Installation on Right Hand Side)

Aircraft: C-GFCC

Date: 24 June 2004

Flight Test Relative Stick Positions

Tape measures were mounted to airframe with tape end secured to cyclic stick such that relative measurements of longitudinal and lateral stick movement could be made. The tape measuring longitudinal movement was mounted in front of the stick so that increasing measurements indicated aft movement of the stick. The tape measuring lateral movement was mounted to the left hand door post so that increasing measurements indicated movement of the stick to the right.

	Baseline Flight		Mod Installed Flight	
1. Staight and Level				
Cruise power setting				
Engine torque	83.7		84.0	
Airspeed	124 kts		119 kts	
Cyclic Stick Position	Long.	Lat.	Long.	Lat.
	28.2 in.	39 in	28.3	38.6
Max. continuous power setting				
Engine torque	94.0		94.0	
Airspeed	129 kts		124 kts	
Cyclic Stick Position	Long.	Lat.	Long.	Lat.
	28.3 in.	38.5 in	28.3	38.6
2. Low Speed Controllability				
Cyclic Stick Position	Long.	Lat.	Long.	Lat.
Hover	30.5	37.5	30.3	37.3
Left at 20 mph	29.3	36.0	30.3	35.5
Right at 20 mph	30.0	39.8	30.6	40.5
Aft at 20 mph	32.3	40.5	31.5	41.0
3. Climbing Flight				
Cyclic Stick Position	Long.	Lat.	Long.	Lat.
Take-off power	29.0	38.5	29.3	38.5
Max. continuous power	29.3	38.5	29.5	38.3

Bell 407

Test Flight for Cargo Basket Installation

Basic helicopter weight and balance amendment no. HSLCB1 dated 23 June 2004

Baseline Flight with Cargo Basket Removed

	Weight	Arm	Moment
Empty weight	3073.6	131.44	403994.0
Oil	13.0	205.00	2665.0
Equipment			
Remove basket	-66.0	113.30	-7477.8
Fuel	831.0	127.90	106284.9
Crew			
Pilot	200.0	65.00	13000.0
Co-pilot	210.0	65.00	13650.0
Ballast			
Mid seat position	395.0	91.00	35945.0
Aft seat position	385.0	129.00	49665.0
Baggage comp	110.0	165.00	18150.0
	98.0	158.00	15484.0
Total	5249.6	124.1	651360.1

Flight Test with Cargo Basket Installed

	Weight	Arm	Moment
Empty weight	3073.6	131.44	403994.0
Oil	13.0	205.00	2665.0
Equipment			
Basket installed			
Fuel	721.0	127.90	92215.9
Crew			
Pilot	200.0	65.00	13000.0
Co-pilot	210.0	65.00	13650.0
Ballast			
Mid seat position	395.0	91.00	35945.0
Aft seat position	385.0	129.00	49665.0
Baggage comp	110.0	165.00	18150.0
	98.0	158.00	15484.0
Total	5205.6	123.9	644768.9

Flight Test with Cargo Basket Installed
(Left Side Installation)

	Weight	Arm	Moment
Empty weight	3073.6	131.44	403994.0
Oil	13.0	205.00	2665.0
Equipment			
Basket installed			
Fuel	600.0	127.90	76740.0
Crew			
Pilot	200.0	65.00	13000.0
Co-pilot	210.0	65.00	13650.0
Ballast			
Mid seat position	395.0	91.00	35945.0
Aft seat position	385.0	129.00	49665.0
Baggage comp	110.0	165.00	18150.0
	98.0	158.00	15484.0
Total	5084.6	123.8	629293.0

Record of Ammendments

Amendment No.: HSLCB1

Aircraft Type: Bell 407

Date: 23-Jun-04

Registration: C-GFCC

Serial No. : 53031

Configuration: High Skids & Low Cargo Basket

	Horizontal:				Lateral:	
Equipment	Weight	Arm	Moment	Date	Arm	Moment
Engine Oil	-13.00	205.00	-2665.00	14-Dec-96		0.00
Plumb Bob	-1.00	170.10	-170.10	14-Dec-96		0.00
Rem. L.W. Float Kit	-322.00	108.00	-34776.00			0.00
Inst. High Skids	131.10	113.00	14814.30			0.00
Inst. Bear Paws	13.00	149.00	1937.00			0.00
Inst. Ski Basket	66.00	113.30	7477.80		30.50	2013.00
Inst. Ballast	24.50	15.60	382.20			0.00
			0.00			0.00
			0.00			0.00
			0.00			0.00
			0.00			0.00
			0.00			0.00
			0.00			0.00
			0.00			0.00
			0.00			0.00
			0.00			0.00
			0.00			0.00
			0.00			0.00
			0.00			0.00
			0.00			0.00
			0.00			0.00
			0.00			0.00
Total	-101.40	128.20	-12999.80		-19.85	2013.00

Derived C of G:

	Weight	Arm	Moment
As Weighed	3175.00	131.34	416995.40
Adjustments	-101.40	128.20	-12999.80
Total	3073.60	131.44	403995.60

Lateral C of G:

Arm	Moment
0.16	504.60
-19.85	2013.00
0.82	2517.60

Derived Horizontal C of G: 131.44

Derived Lateral C of G: 0.82

Derived Empty Weight: 3073.60

The maintenance described herein has been performed in accordance with the applicable standards of airworthiness.

Authorized by:

License: June 23/09

Date:

AMO
80-90
0.5

Amendment No.: HSLCB1

Date: 23-Jun-04

Serial No. : 53031

[illegible]

Lateral C of G:

Arm	Moment
0.16	504.60
-19.85	2013.00
0.82	2517.60

Derived Lateral C of G: 0.82

The maintenance described herein has been performed in accordance with the applicable standards of airworthiness.

MR

License: June 23/09

Date: 05

AMO
80-90
0.5


 Transport Canada
 Transports Canada

FLIGHT AUTHORITY

AUTORITÉ DE VOL

To - À:

Omega Air Corporation

4360 Agar Drive, Richmond, BC

Nationality and Registration Marks Marques de nationalité et d'immatriculation	Aircraft Manufacturer and Model Constructeur et modèle de l'aéronef	Aircraft Serial Number Numéro de série de l'aéronef
C-GPCC	Bell Helicopters Division of Textron Canada Ltd. 407	53031

☐ CERTIFICATE OF AIRWORTHINESS CERTIFICAT DE NAVIGABILITÉ

In respect of the noise emission standards this aircraft:
En vertu des normes d'émission de bruit, l'aéronef mentionné:

☐ is not required to comply with requirements
n'est pas obligé de satisfaire aux exigences

☐ complies with the requirements specified below
satisfait aux exigences précisées ci-dessous

☐ SPECIAL CERTIFICATE OF AIRWORTHINESS CERTIFICAT SPÉCIAL DE NAVIGABILITÉ

☐ Provisional - Provisoire ☐ Amateur-Built - Construction amateur ☐ Owner Maintenance - Maintenance par le propriétaire

☐ Restricted - Restreint ☐ Limited - Limité

This document is subject to the following operating conditions of issue: Le présent document est assujéti aux conditions d'exploitation suivantes: **Indicate Numbers / Inscrire les numéros:**

The aircraft may only be operated from:
L'aéronef ne peut être exploité qu'à partir de:

Gross take-off weight not to exceed:
Ne pas excéder la masse maximale brute au décollage:

_____ lb _____ kg

☐ As per Flight Manual - Selon le manuel de vol

☒ Flight Permit - Specific Purpose
Permis de vol - Fin Spécifique

☐ Ferry Flight
Vol de convoyage

☐ Importation or exportation flight
Vol pour fin d'importation ou d'exportation

☒ Other temporary purposes (Specify)
Pour d'autres fins temporaires (Préciser) Test Purposes following Modification or Maintenance

☐ Flight Permit - Experimental
Permis de vol - Expérimental

☐ Demonstration, market survey or crew training
Vol de démonstration, étude de marché ou formation d'équipage

Flight from - Vol de	To - À	To - À
YVR Local	Various Test Flights	YVR Local

This document is subject to the following operating conditions of issue: Le présent document est assujéti aux conditions d'exploitation suivantes: **Indicate Numbers: 6, 8, 9, 13, 16 and Block 7 of application**

The aircraft may only be operated from:
L'aéronef ne peut être exploité qu'à partir de:

Gross take-off weight not to exceed:
Ne pas excéder la masse maximale brute au décollage:

_____ lb _____ kg

☒ As per Flight Manual - Selon le manuel de vol

Vancouver International Airport

This document is valid for the number of days indicated on the right, following the date of issue. Where pertinent, a replacement flight authority will be issued to you. Le présent document reste valide pendant le nombre de jours indiqués à droite qui suivent la date de délivrance. S'il y a lieu, une autorité de vol de remplacement vous sera délivrée.

Days - Jours: **90**

For the Minister of Transport - Pour le ministre des Transports	Date of Issue (Y/M/D) - Date de délivrance (A/M/J)	Region - Région
<i>John Dystensen</i>	2004/06/23	Pacific TAH-RIC

Fee paid - Montant versé \$ 45.00 ☐ Cash ☐ Cheque Receipt No. N° du reçu Account 11620

1 of 2

Operating Conditions

1. Valid for the purpose of (specify purpose);
2. Use as a commercial aircraft prohibited;
3. Crew members only, no passengers;
4. Crew members only - no passengers, except those persons whom the pilot-in-command determines as having a bona fide interest in the demonstration;
5. Crew members shall be the holders of valid and subsisting pilot licences issued or endorsed by Canada or the (state of registry to be specified) and which are appropriate to their duties;
6. Gross take-off weight not to exceed (specific weight to be listed on the flight permit);
7. Flight into known or predicted icing conditions prohibited;
8. VNE to be established by flight test;
9. Day VFR only;
10. VFR only;
11. Flight over built-up areas prohibited;
12. Flight over built-up areas prohibited, and flight in congested airspace to be avoided;
13. Flight over built-up areas prohibited except during take-offs and landings;
14. Flight authority issued by (specify authority) shall be valid and shall be carried on board the aircraft together with this validation;
15. Controlling Air Traffic Control unit to be informed of the experimental nature of the aircraft and the evaluation program prior to flight;
16. The aircraft shall be formally or provisionally registered in (specify state);
17. Compliance required with the conditions on the (specify type of permit and authority);
18. Controlling Agency at airport of take-off shall be informed of overload conditions prior to take-off;
19. Permission of the foreign aviation authority required prior to flight in their airspace;
20. The aircraft can only operate from a base indicated by Transport Canada in order to provide the highest degree of safety for the operation of the aircraft;
21. The aircraft shall not be operated (flown) more than 25 nautical miles from the base mentioned in (20) except with written authority of the Regional Director Aviation Licensing, (specify region) Region, which will be provided, taking into account the safety of the flight;
22. The aircraft shall not be flown over any built-up area, or open air assembly of persons;
23. Carriage of persons other than for dual instruction is prohibited (not to be used for single seat aircraft);
24. Aerobatic flight is prohibited (not to be used for balloons);
25. During the first 5 hours of flight, the aircraft can only be flown by pilots who have acquired not less than 100 hours of pilot-in-command flight time in powered aircraft (not to be used for gliders, gyroplanes, or balloons);^a
26. Aircraft is to be registered for "Private Purposes" only;
27. Aircraft to be placarded in the cockpit "Restricted - Agricultural Purposes Only";
28. Validity period;
29. Flight testing to be conducted away from built-up areas, airways and air routes;
30. Ferry-flight (specify from) to (specify to) to be via (specify routing) with technical landings as required;
31. The side of the aircraft fuselage is to be placarded, in a place that is readily visible to persons entering the aircraft, in letters at least 3/8 inch in height and of a colour that contrasts sharply with the background on which they are shown, in both official languages, as follows:

NOTICE: THIS AIRCRAFT IS OPERATING WITHOUT A CERTIFICATE OF AIRWORTHINESS.

AVIS : CET AÉRONEF VOLE SANS CERTIFICAT DE NAVIGABILITÉ.

Conditions d'exploitation

1. Valide aux fins de (préciser les fins);
2. L'exploitation à titre d'aéronef commercial est interdite;
3. Membres d'équipage seulement - pas de passagers;
4. Membres d'équipage seulement - pas de passagers, sauf les personnes qui de l'avis du commandant de bord ont un intérêt réel dans la démonstration;
5. Les membres d'équipage doivent être titulaires de licences de pilote valides et en vigueur délivrées ou annotées par le Canada ou (préciser l'État d'immatriculation) et correspondant à leurs fonctions;
6. Ne pas excéder la masse maximale brute au décollage (qui doit être indiquée sur le permis de vol);
7. Vol interdit dans des conditions de givrage existantes ou prévues;
8. La VNE doit être établie par essai en vol;
9. VFR de jour seulement;
10. VFR seulement;
11. Le survol des zones bâties est interdit;
12. Le survol des zones bâties est interdit, et le vol dans un espace aérien à forte densité de circulation est à éviter;
13. Le survol des zones bâties est interdit, sauf au décollage et à l'atterrissage;
14. L'autorité de vol délivrée par (préciser l'autorité) doit être en vigueur et se trouver à bord de l'aéronef avec la présente validation;
15. L'unité de contrôle de la circulation aérienne qui exerce le contrôle doit être informée avant le vol de la nature expérimentale de l'aéronef et du programme d'évaluation;
16. L'aéronef doit être officiellement ou provisoirement immatriculé dans (préciser l'État);
17. La conformité avec les conditions figurant sur le (préciser le type de permis et l'autorité) est obligatoire;
18. L'organisme qui exerce le contrôle à l'aéroport de décollage doit être informé avant le décollage des conditions de surcharge;
19. Le vol dans l'espace aérien étranger est interdit, sauf avec l'autorisation préalable de l'autorité de l'aviation civile étrangère en cause;
20. L'aéronef ne peut être exploité qu'à partir de la base précisée par Transports Canada de façon à garantir le degré optimal de sécurité d'exploitation de l'aéronef;
21. L'aéronef ne peut être exploité que dans une zone d'un rayon maximum de 25 NM de la base mentionnée à l'alinéa 20, sauf avec l'autorisation écrite du directeur régional de la navigabilité, région (préciser la région), qui sera fournie compte tenu de la sécurité du vol;
22. Il est interdit de survoler des zones bâties ou des rassemblements en plein air;
23. Il est interdit de transporter des personnes, sauf pour l'instruction en double commande (ne pas utiliser dans le cas des aéronefs monoplaces);
24. Le vol d'acrobatie aérienne est interdit (ne pas utiliser dans le cas de ballons);
25. Seul un pilote ayant accumulé au moins 100 heures de vol à titre de commandant de bord d'aéronefs propulsés par un organe moteur est autorisé à piloter cet aéronef au cours des cinq premières heures de vol (ne pas utiliser dans le cas des planeurs, des autogires ou des ballons);
26. L'aéronef doit être immatriculé « à des fins privées » seulement;
27. Une affiche « Restreint - fins agricoles seulement » doit être apposée dans le poste de pilotage;
28. Période de validité;
29. Les essais en vol doivent être effectués hors des zones bâties, des voies aériennes et des routes aériennes;
30. Le vol de convoyage doit être effectué de (préciser la partance) à (préciser la destination) via (préciser la route) avec escales techniques au besoin;
31. Une affiche doit être apposée au côté du fuselage de l'aéronef, en un endroit facilement visible pour les personnes qui montent dans l'aéronef, en lettres d'au moins 3/8 pouce de hauteur et d'une couleur contrastant clairement avec le fond sur lequel elles sont apposées, dans les deux langues officielles, portant les mots :

AVIS : CET AÉRONEF VOLE SANS CERTIFICAT DE NAVIGABILITÉ.

NOTICE: THIS AIRCRAFT IS OPERATING WITHOUT A CERTIFICATE OF AIRWORTHINESS.

Jun 23 2004 8:11

Omega Aviation

604-273-8991

p. 3

JUN-21-2004 09:59 FROM: AERO DESIGN

14032506333

TO: 16042738991

P.2

2nd LIMITATION SHEET FOR FLIGHT PERMIT OF 2004/06/23


 Transport Canada
 Transports Canada
 Aviation Aviation

 APPLICATION FOR A
 FLIGHT PERMIT

 DEMANDE DE
 PERMIS DE VOL

INSTRUCTIONS

Print or type all entries. See Airworthiness Manual Chapter 507D and Airworthiness Manual Advisory AMA 507D/1 for the use and disposition of this form.
 Dactylographier ou écrire en lettres majuscules. Consulter le chapitre 507D du Manuel de navigabilité et la circulaire consultative AMA 507D/1 qui précèdent le livre de remplissage d'accomplir la présente formule.

A. AIRCRAFT IDENTIFICATION IDENTIFICATION DE L'AERONEF

1. Owner - Propriétaire

Omega Helicopters

ACCT # 11620

2. Address - Adresse

4360 Agar Drive, Richmond BC

3. Aircraft Manufacturer - Constructeur de l'aéronef

Bell

4. Model - Modèle

407

5. Serial Number - Numéro de série

53031

6. Nationality and Registration Marks
Marques de nationalité et d'immatriculation

C-GFCC

B. FLIGHT PERMIT REQUESTED - Check applicable boxes - PERMIS DE VOL DEMANDE - Cocher la ou les cases(s) valant(s)

1. ☐ Experimental Flight Permit
Permis de vol expérimental2. ☒ Specific Purpose Flight Permit
Permis de vol à une fin spécifique(a) ☐ Ferry Flight
Vol de convoyage(b) ☐ In connection with Exportation or Importation
Vol à l'importation ou à l'exportation(c) ☐ Demonstration, Market Survey or Crew Training
Vol de démonstration, étude de marché ou formation d'équipage(d) ☒ Flight Test following repair, modification or maintenance
Essai en vol après réparation, modification ou maintenance(e) ☐ Other purpose (Specify)
Autre fin (Préciser)

C. FLIGHT DESCRIPTION AND AIRCRAFT LIMITATIONS

Description of Flight(s). Use attachment when appropriate

DESCRIPTION DU VOL ET LIMITATIONS DE L'AERONEF
Description du ou des vol(s). Joindre une feuille au besoin

1. From - Aéroport de départ

YVR

2. To - Aéroport de destination

YVR

3. Via - Escales

4. Date

22 June 2004

5. Duration - Durée

90 Days

6. Aircraft does not meet the applicable airworthiness requirements as follows: - Raisons pour lesquelles l'aéronef ne satisfait pas aux exigences de navigabilité en vigueur

- 1) Installation of new forward landing gear fittings in accordance with drawing 60603.
- 2) Installation of blocks in aft landing gear fittings in accordance with drawing 60602.
- 3) Installation of cargo basket on right side of helicopter in accordance with drawing 60601, using provisions incorporated in 1) and 2) above.

7. The following restrictions are considered necessary for safe operations: - Les restrictions suivantes sont nécessaires pour la conduite des vols en toute sécurité:

- Essential Crew only
- No flight over built up areas
- Day VFR flight conditions only
- Pop out floats must be disabled if installed
- Vne = 156 KIAS
- Max. winds from rear quadrants 25 Kts
- Log book entry stating that the installation was performed in accordance with the drawings listed in section 6., signed by an AME

D. CERTIFICATION

I hereby certify that the aircraft described above is in a condition for safe operation.

Je, soussigné, certifie que l'aéronef décrit ci-dessus est en bon état de vol.

Signature

Date (Y-A-M-D)

2004-06-21

☐ Registered Owner as shown on the Certificate of Registration
 Propriétaire enregistré selon le certificat d'immatriculation
☒ Authorized Representative
 Représentant autorisé

prouline
 0318441
 4239.88

straight q level.

Taper 83.7
 AS 124 KTS

	long lat	28 $\frac{3}{16}$ 39
Left	29 $\frac{1}{4}$	36
Right	30.	39 $\frac{3}{4}$
Abg.	30 $\frac{1}{2}$	37 $\frac{1}{2}$
Stop	32 $\frac{1}{4}$	40 $\frac{1}{2}$



CLIMP TOP

TOP	29.	38 $\frac{1}{2}$
MCP	29 $\frac{1}{4}$	38 $\frac{1}{2}$

FUEL BURN
 110 lb.

Use 140 KTS

LONG

LAT

28

40

Shiny ho & level
Map Cart.

Target 94.0

28 $\frac{1}{4}$

35 $\frac{1}{2}$

STATION & LEVEL

1000 84.0

N/3

119 KTS

64 F

18 C

Long

Lat

$28 \frac{1}{4}$

$38 \frac{5}{8}$

HOVER

RIGHT

$30 \frac{5}{8}$

$40 \frac{1}{2}$

LEFT

$30 \frac{1}{4}$

$35 \frac{1}{2}$

STOP

$30 \frac{1}{4}$

$37 \frac{3}{4}$

Back

$31 \frac{1}{2}$

41

CLIMB

TOP

$29 \frac{1}{4}$

— $38 \frac{1}{2}$

MCP

$29 \frac{1}{2}$

$38 \frac{1}{4}$

MAX. CONT
STRAIGHT & LEVE

$28\frac{1}{4}$

$30\frac{1}{2}$

94.0 Torque.

A/S. 124 KST.

V_{ne} .

VIBRATION

$28\frac{1}{2}$

~~39~~ 401
39

AUTOROTATION.

110 KTS

Bush

FULE

3073

721

5190

5236
46
5190

110
64
46

~~5236~~
~~46~~

NO BASKET

127.9

65.0 FUEL
65.0 PILOT
65.0 CO-PILOT

129 AFT R.H.

AFT L.H.

91 [MID R.H.

MID L.H.

BAGGAGE

25.9
2.2
55.2 = 110

3073

66

3007

831

200

210

195

190

195

200

110 165

98 158

5236

5250

AERO DESIGN LTD.

2013 – 39th Ave N. E., Calgary, Alberta, T2E 6R7

aerodesign@telusplanet.net

F A X C O V E R S H E E T

DATE: June 21, 2004

TIME: 10:00 AM

TO: **Sean Johnson**

PHONE: 604-273-5312

Omega Helicopters

FAX: 604-273-8991

FROM: Jeff Clarke
Aero Design Ltd.

PHONE: 403-250-8027

FAX: 403-250-8333

Number of pages including cover sheet: 2

RE: FLIGHT PERMIT APPLICATION

Sean,

Attached is the flight permit application form for the Cargo Basket installation on the Bell 407. The serial number and registration must be put on the form (section A, 5. and 6.), and the certification must be signed (section D).

Please call if you have any questions.

Jeff

internet
member services
INBOX Compose Options Search Help Addressbook Logout

INBOX: RE: Bell 407 Cargo Basket (6 of 8)

Delete | Reply | Reply to All | Forward | Redirect | Message Source | Save as | Print

Back to INBOX ◀▶

Date: Fri, 18 Jun 2004 16:07:45 -0400

From: "Brulotte, Michel" <BRULOTM@tc.gc.ca>

To: "E. Burgoin" <ted.aerodesign@telusplanet.net>

Cc: "Staal, Jack" <STAALJ@tc.gc.ca>

Subject: RE: Bell 407 Cargo Basket

2 unnamed text/html 5.36 KB

Ted, Jack:

As discussed by Ted and I yesterday the original flight test performed on the 407 in September 2000 showed that mast bending was not an issue. In fact there were no flight issues with the basket.

I am comfortable with the proposal that Ted has made with respect to the company doing a flight test to assess vibration, and handling qualities since it is my expectation that there will not be any significant changes from what was already observed on the larger/similar basket flown on the 407.

If there are any questions then please don't hesitate to contact me.

Michel

-----Original Message-----

From: E. Burgoin [mailto:ted.aerodesign@telusplanet.net]**Sent:** June 18, 2004 1:54 PM**To:** Brulotte, Michel**Cc:** Staal, Jack**Subject:** Bell 407 Cargo Basket

Michel

Further to our conversation yesterday morning on the subject of flight testing the installation of our cargo basket on a Bell 407.

Background:

We have a cargo basket installed on the right hand side of a Bell 407 which is mounted high blocking the right hand passenger door. This installation was flown by yourself in approximately 1990 in Vancouver. Your flight test data from that flight test shows no difference in stick position between the basket removed and basket installed conditions and as a result "mast bending" considerations were deemed not to be an issue at that time.

We have a similar cargo basket that is approx. 15% less in frontal area and 20 inches shorter in length that is mounted on the right hand side of a Bell 206L series. This basket has been lowered so that it does not interfere with opening the right hand passenger door. This installation was flown by Serge Massicotte at WiskAir in 2002. Flight test data from this flight test again shows no difference in stick position between the basket removed and basket installed conditions, and as in the above mentioned installation "mast

bending" considerations were deemed not to be an issue.

Current Project.

The Bell 206L series installation as flown by Serge can be fitted to the Bell 407 helicopter with minor changes to the mounting attachments. Structural issues related to these changes have been dealt with by load testing and found to be satisfactory. The issue of compliance with flight requirements need to deal with.

Omega in Vancouver wants this installation if we can provide the installation for this summer season.

Flight Test

Confirming our discussion, it is my understanding that compliance with flight test items can be dealt with by a flight test conducted by myself and the Company pilot and that Transport Canada will not be flying this installation.

Further the issue of "mast bending" has been dealt with by the previous flight test on the Bell 407 (2000) and Bell 206L-3 (2002). It is anticipated that we will take comparative stick position measurements during these flight tests as a matter of course.

Please confirm this is your understanding and discuss with Jack Staal if/as required.

Thanks,

Ted.

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Transport Canada
Aviation

Transports Canada
Aviation

APPLICATION FOR A
FLIGHT PERMIT

DEMANDE DE
PERMIS DE VOL

INSTRUCTIONS

Print or type all entries. See Airworthiness Manual Chapter 507D and Airworthiness Manual Advisory AMA 507D/1 for the use and disposition of this form.
Dactylographier ou écrire en lettres moulées. Consulter le chapitre 507D du Manuel de navigabilité et la circulaire consultative AMA 507 D/1 qui précisent la façon de remplir et d'achever la présente formule.

A. AIRCRAFT IDENTIFICATION IDENTIFICATION DE L'AÉRONEF

1. Owner - Propriétaire Omega Helicopters			
2. Address - Adresse 4360 Agar Drive, Richmond BC			
3. Aircraft Manufacturer - Constructeur de l'aéronef Bell	4. Model - Modèle 407	5. Serial Number - Numéro de série	6. Nationality and Registration Marks Marques de nationalité et d'immatriculation

B. FLIGHT PERMIT REQUESTED - Check applicable boxes - PERMIS DE VOL DEMANDÉ - Cocher la ou les case(s) voulue(s)

1. <input type="checkbox"/> Experimental Flight Permit Permis de vol expérimental			
2. <input checked="" type="checkbox"/> Specific Purpose Flight Permit Permis de vol à une fin spécifique			
(a) <input type="checkbox"/> Ferry Flight Vol de convoyage	(b) <input type="checkbox"/> Importation or Exportation Flight Vol à l'importation ou à l'exportation	(c) <input type="checkbox"/> Demonstration, Market Survey or Crew Training Vol de démonstration, étude de marché ou formation d'équipage	
(d) <input checked="" type="checkbox"/> Flight Test following repair, modification or maintenance Essais en vol après réparation, modification ou maintenance	(e) <input type="checkbox"/> Other purpose (Specify) Autre fin (Préciser)		

C. FLIGHT DESCRIPTION AND AIRCRAFT LIMITATIONS DESCRIPTION DU VOL ET LIMITATIONS DE L'AÉRONEF
Description of Flight(s) Use attachment when appropriate Description du ou des vols Joindre une feuille au besoin

1. From - Aérodrome de départ YVR	2. To - Aérodrome de destination YVR		
3. Via - Escales	4. Date 22 June 2004	5. Duration - Durée 90 Days	
6. Aircraft does not meet the applicable airworthiness requirements as follows: - Raisons pour lesquelles l'aéronef ne satisfait pas aux exigences de navigabilité en vigueur: 1) Installation of new forward landing gear fittings in accordance with drawing 60602. 2) Installation of blocks in aft landing gear fittings in accordance with drawing 60602. 3) Installation of cargo basket on right side of helicopter in accordance with drawing 60601, using provisions incorporated in 1) and 2) above.			
7. The following restrictions are considered necessary for safe operations: - Les restrictions suivantes sont nécessaires pour la conduite des vols en toute sécurité: - Essential Crew only - No flight over built up areas - Day VFR flight conditions only - Pop out floats must be disabled if installed - Vne = 156 KIAS - Max. winds from rear quadrants 25 kts - Log book entry stating that the installation was performed in accordance with the drawings listed in section 6., signed by an AME			

D. CERTIFICATION

I hereby certify that the aircraft described above is in a condition for safe operation.
Je, soussigné, certifie que l'aéronef décrit ci-dessus est en bon état de vol.

Signature	Date (Y-A - M - D-J)	<input type="checkbox"/> Registered Owner as shown on the Certificate of Registration Propriétaire enregistré selon le certificat d'immatriculation
		<input type="checkbox"/> Authorized Representative Représentant autorisé

AERO DESIGN LTD.

2013 – 39 Avenue N.E., Calgary, Alberta, T2E 6R7

Tel: 403-250-8027

Fax: 403-250-8333

aerodesign@telusplanet.net

4 June, 2004

Transport Canada
Aircraft Certification Division
11th Floor, Canada Place
9700 Jasper Avenue
Edmonton, Alberta
T5J 4E6

Attn: Jack Staal

Your File # : C-02-0218

Our File # : 606

Re: Revision Of SH00-48

Jack,

This STC is amended to include a low-mounted basket configuration for the Bell 407's. The basket and beams are interchangeable with those used on the Bell 206L series. Some drawings are updated and corrected. Please find attached the following documents related to this project:

Draft STC	SH00-48	Issue 3
Modification Approval Request Application Form	MOD606	Revision 0
Compliance Program	CP606	Revision 0
Project Summary	PS606	Revision 0
Document Control List	DCL606	Revision 0
Document Control List	DCL492	Revision 3
Document Control List	DCL493	Revision 4
Engineering Report	ER 606.01	Revision 0
Engineering Report	ER 606.02	Revision 0
Engineering Report	ER 492.01	Revision 0
Engineering Report	ER 492.02	Revision 0
Engineering Report	ER 493.01	Revision 0
Maintenance Instructions	MI 606.01	Revision 0
Flight Manual Supplement	FMS 606.01	Revision 0
↳ + COVERS OF FMS 492.01 & FMS 493.01 TO RE-STAMP		
Installation Drawing, 407 Basket	60601	Revision 0
Installation Drawing, 407 Provisions	60602	Revision 0
Fabrication Drawing	60620	Revision 0
Fabrication Drawing	60621	Revision 0
Fabrication Drawing	60622	Revision 0
Fabrication Drawing	60624	Revision 0
Installation Drawing	49301	Revision 2
Fabrication Drawing	49311	Revision 2
Fabrication Drawing	49312	Revision 2

AERO DESIGN LTD.

2013 – 39 Avenue N.E., Calgary, Alberta, T2E 6R7

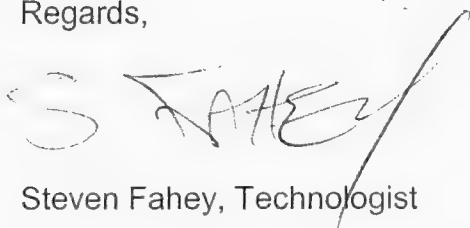
Tel: 403-250-8027

Fax: 403-250-8333

aerodesign@telusplanet.net

Installation Drawing	49201	Revision 1
Fabrication Drawing	49205	Revision 1
Fabrication Drawing	49207	Revision 1
Fabrication Drawing	49208	Revision 1
Fabrication Drawing	49209	Revision 1
Fabrication Drawing	49210	Revision 1
Fabrication Drawing	49211	Revision 1
Fabrication Drawing	49212	Revision 0
Fabrication Drawing	49213	Revision 1
Fabrication Drawing	49214	Revision 0
Fabrication Drawing	49215	Revision 0
Fabrication Drawing	49216	Revision 0
Fabrication Drawing	49217	Revision 1
Fabrication Drawing	49218	Revision 1
Fabrication Drawing	49219	Revision 0
Fabrication Drawing	49221	Revision 1
Fabrication Drawing	36255	Revision 1
Fabrication Drawing	36261	Revision 1
Fabrication Drawing	36262	Revision 1
Fabrication Drawing	36271	Revision 0
Fabrication Drawing	36272	Revision 0
Fabrication Drawing	36273	Revision 0
Fabrication Drawing	36274	Revision 0
Fabrication Drawing	36275	Revision 1
Fabrication Drawing	36276	Revision 0
Fabrication Drawing	36277	Revision 0
Fabrication Drawing	36278	Revision 1
Fabrication Drawing	36280, Sheet 1	Revision 2
Fabrication Drawing	36280, Sheet 2	Revision 2

Regards,



Steven Fahey, Technologist

Encl.

MODIFICATION APPROVAL REQUEST APPLICATION FORM

MOD606, Rev. 0

1. NAME AND ADDRESS OF APPLICANT: AERO Design Ltd. 2013 39th Ave NE Calgary, AB, T2E 6R7		2. IDENTIFICATION OF PRODUCT <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%;">MAKE: Bell</td> <td style="width:50%;">MODEL: 407</td> </tr> </table>			MAKE: Bell	MODEL: 407																																																																																												
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ALL CORRESPONDANCE TO: AERO Design Ltd. 2013 39th Ave N.E. Calgary, AB T2E 6R7		SERIAL No.: All eligible		REGISTRATION: All eligible																																																																																														
3. REQUEST FOR: <table style="width:100%;"> <tr> <td style="width:45%;">A. SUPPLEMENTAL TYPE CERTIFICATE (STC)</td> <td style="width:5%; text-align: center;"><input type="checkbox"/></td> <td style="width:50%;"></td> </tr> <tr> <td>B. STC/STA REVISION</td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>STC/STA No. SH00-48</td> </tr> <tr> <td>C. LIMITED SUPPLEMENTAL TYPE CERTIFICATE (LSTC)</td> <td style="text-align: center;"><input type="checkbox"/></td> <td></td> </tr> <tr> <td>D. LIMITED STC/STA REVISION</td> <td style="text-align: center;"><input type="checkbox"/></td> <td>LSTC/LSTA No.</td> </tr> <tr> <td>E. F.A.A. SUPPLEMENTAL TYPE CERTIFICATE</td> <td style="text-align: center;"><input type="checkbox"/></td> <td></td> </tr> <tr> <td>F. F.A.A. STC REVISION</td> <td style="text-align: center;"><input type="checkbox"/></td> <td>STC No.</td> </tr> <tr> <td>G. FAMILIARIZATION OF F.A.A. STC</td> <td style="text-align: center;"><input type="checkbox"/></td> <td>STC No.</td> </tr> <tr> <td>H. REPAIR DESIGN APPROVAL (RDC)</td> <td style="text-align: center;"><input type="checkbox"/></td> <td></td> </tr> <tr> <td>I. PARTS DESIGN APPROVAL (PDA)</td> <td style="text-align: center;"><input type="checkbox"/></td> <td></td> </tr> </table>					A. SUPPLEMENTAL TYPE CERTIFICATE (STC)	<input type="checkbox"/>		B. STC/STA REVISION	<input checked="" type="checkbox"/>	STC/STA No. SH00-48	C. LIMITED SUPPLEMENTAL TYPE CERTIFICATE (LSTC)	<input type="checkbox"/>		D. LIMITED STC/STA REVISION	<input type="checkbox"/>	LSTC/LSTA No.	E. F.A.A. SUPPLEMENTAL TYPE CERTIFICATE	<input type="checkbox"/>		F. F.A.A. STC REVISION	<input type="checkbox"/>	STC No.	G. FAMILIARIZATION OF F.A.A. STC	<input type="checkbox"/>	STC No.	H. REPAIR DESIGN APPROVAL (RDC)	<input type="checkbox"/>		I. PARTS DESIGN APPROVAL (PDA)	<input type="checkbox"/>																																																																				
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10. In addition to the payment of Aircraft Certification approval fees as prescribed in Canadian Aviation Regulations (CAR) Section 104, I agree to reimburse Transport Canada incremental expenses as in Aviation Regulation Directive No. 3, or equivalent, as applicable. For further details governing cost recovery, refer to AMA 513/4. <table style="width:100%; margin-top: 20px;"> <tr> <td style="width:40%;"> PER: <small>SIGNATURE OF APPLICANTS</small> </td> <td style="width:40%; text-align: center;"> Consultant <hr style="width: 80%; margin: 0;"/> <small>TITLE</small> </td> <td style="width:20%; text-align: right;"> 31 May, 2004 <hr style="width: 80%; margin: 0;"/> <small>DATE</small> </td> </tr> </table>					PER: <small>SIGNATURE OF APPLICANTS</small>	Consultant <hr style="width: 80%; margin: 0;"/> <small>TITLE</small>	31 May, 2004 <hr style="width: 80%; margin: 0;"/> <small>DATE</small>																																																																																											
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DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
60601	Cargo Basket Installation	0
60602	External Attachment Provisions Installation	0
FMS606.01	Flight Manual Supplement	0
MI606.01	Maintenance Instructions	0
FABRICATION DOCUMENTS		
60620	Block Fabrication	0
60621	Forward Fitting Fabrication	0
60622	Barrel Nut Fabrication	0
60624	Barrel Nut Fabrication	0
49205	Cargo Basket Assembly	1
49207	Cargo Basket Lid	1
49208	Cargo Basket Body	1
49209	End Hoop Assembly	1
49210	Basket Components – Hoops	1
49211	Basket Components – Rim	1
49212	Basket Components – Rim	0
49213	Basket Components – Lid Brace	1
49214	Basket Components – Spine	0
49215	Basket Components – Spacer	0
49216	Basket Components – Spacer	0
49217	Basket Components – Lug	1
49218	Placard	1
49219	Spacer	0
49221	Support Beams	1
36255	Handle Assembly	1
36261	Handle Bar Assembly	1
36262	Handle Bracket Assembly	1
36271	Handle Lever	0
36272	Basket Bracket	0
36273	Lid Bracket	0
36274	Bushing	0
36275	Bushing	1
36276	Spring Hook	0
36277	Handle Bar	0
36278	Spring	1
36280, Sheet 1	Brace	2
36280, Sheet 2	Brace	2
ENGINEERING DOCUMENTS		
ER606.01	Engineering Report – Basket Installation	0
ER606.02	Engineering Report – Load Test	0
ER492.01	Engineering Report – Basket Installation	0
ER492.02	Engineering Report – Basket Load Tests	0
ER493.01	Engineering Report – External Attachment Prov.	0
APPROVAL:	ORIGINAL DATE: 31 May, 2004 REVISION DATE:	AERO DESIGN LTD. 2013 - 39 th Avenue N.E. Calgary, Alberta T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333
	SHEET 1 OF 1	BELL 407 Side-Mounted Cargo Basket Installation
	DCL606	Rev. 0

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
49301	External Attachment Provisions Installation	2
FMS493.01	Flight Manual Supplement	0
MI 493.01	Maintenance Instructions	0
FABRICATION DOCUMENTS		
49311	Forward Fitting	0
49312	Aft Fitting	0
49311	Forward Fitting	2
49312	Aft Fitting	2
49319	Washer	0
49320	Barrel Nut	0
49320	Barrel Nut	1
49321	Spacer	0
ENGINEERING DOCUMENTS		
ER493.01	Engineering Report	0
ER493.03	Test Report	0
261.02	Honeycomb Insert Load Test Report	0
APPROVAL:	ORIGINAL DATE: 19 May, 2002 REVISION DATE: 3 June, 2004	AERO DESIGN LTD. 2013 – 39 th Avenue NE Calgary, Alberta T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333
	SHEET 1 OF 1	BELL 206L SERIES External Attachment Provisions
	DCL493	Rev. 4

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
49201	Cargo Basket Installation	1
FMS492.01	Flight Manual Supplement	1
MI492.01	Maintenance Instructions	1
FABRICATION DOCUMENTS		
49205	Cargo Basket Assembly	1
49207	Cargo Basket Lid	1
49208	Cargo Basket Body	1
49209	End Hoop Assembly	1
49210	Basket Components – Hoops	1
49211	Basket Components – Rim	1
49212	Basket Components – Rim	0
49213	Basket Components – Lid Brace	1
49214	Basket Components – Spine	0
49215	Basket Components – Spacer	0
49216	Basket Components – Spacer	0
49217	Basket Components – Lug	1
49218	Placard	1
49219	Spacer	0
49221	Support Beams	1
36255	Handle Assembly	1
36261	Handle Bar Assembly	1
36262	Handle Bracket Assembly	1
36271	Handle Lever	0
36272	Basket Bracket	0
36273	Lid Bracket	0
36274	Bushing	0
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36276	Spring Hook	0
36277	Handle Bar	0
36278	Spring	1
36280, Sheet 1	Brace	2
36280, Sheet 2	Brace	2
ENGINEERING DOCUMENTS		
ER492.01	Engineering Report – Basket Installation	0
ER492.02	Engineering Report – Basket Load Tests	0
APPROVAL:	ORIGINAL DATE: 17 May, 2002	AERO DESIGN LTD. 2013 – 39 th Ave. NE Calgary, Alberta T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333
	REVISION DATE: 31 May, 2004	
	SHEET 1 OF 1	BELL 206L SERIES Side-Mounted Cargo Basket Installation
	<div> <div>DCL492</div> <div>Rev.</div> <div>3</div> </div>	

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

APPLICANT: AERO Design Ltd.
2013 39th Avenue NE
Calgary, Alberta, T2E 6R7

DATE: 29 March, 2004
REV. No. 0

CORRESPONDANCE TO:
(If other than applicant)

MAKE: Bell Helicopter
MODEL: 407

REGISTRATION: All Applicable
SERIAL No.: All Applicable

NATURE OF WORK: Installation of Side-Mounted External Cargo Basket

MODEL CERTIFICATION BASIS: FAR 27, Amendment 27-30, with exceptions as noted below.

MODIFICATION CERTIFICATION BASIS: FAR 27, Amendment 27-30, with exceptions as noted below.

Airworthiness Requirement		Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
Paragraph	Amdt.					
Subpart B – Flight						
27.27	30	Centre of Gravity Limits	N/A			No change from Type Approval.
27.29	30	Empty Weight and Corresponding C of G	Data specified on inst'n drawing		X	
27.51	30	Takeoff	Flight Test	X		Flight tests performed using the same basket on Bell 206L and similar basket on Bell 407 to satisfy the flight test requirements. Limitations established in previous flight tests to be used with this installation.
27.65	30	Climb: All Engines Operating	Flight Test	X		
27.71	30	Gliding Performance	Flight Test	X		
27.75	30	Landing	Flight Test	X		
27.141	30	Flight Characteristics – General	Flight Test	X		
27.143	30	Controllability and Maneuverability	Flight Test	X		
27.151	30	Flight controls	Flight Test	X		
27.161	30	Trim	Flight Test	X		
27.171	30	Stability – General	Flight Test	X		
27.173	1	Longitudinal Stability	Flight Test	X		
27.175	1	Demonstration of Longitudinal Stability	Flight Test	X		
27.177	30	Static Directional Stability	Flight Test	X		
27.241	30	Ground Resonance	Flight Test	X		
27.251	30	Vibration	Flight Test	X		
Subpart C – Strength Requirements						
27.301	30	Loads – Air Drag Loads	Analysis		X	
27.301	30	Loads – Inertia Loads	Compliance with 27.337 and 27.561		X	

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

Airworthiness Requirement	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
Paragraph	Amdt.				
27.303	30	Factor of Safety		X	
27.305	30	Strength and Deformation		X	
27.307	30	Proof of Structure		X	
27.337(a)	30	Limit Maneuvering Load Factor – Positive		X	Critical load factor in downward direction.
27.471	30	Ground Loads - General	X		Landing gear loads on fitting to be assessed by comparison with ultimate strength of original Type Approved fitting, and test as required.
		to determine equivalent strength to existing fitting			No change to assumptions used for Type Approved configuration
27.473	30	Ground Loading Conditions and Assumptions			
27.501	30	Ground Loading Conditions – Landing Gear with Skids	X		Loads from the cargo basket on the landing gear fittings do not use skid tubes or cross tubes in load path.
27.547	30	Main Rotor Structure	X		See comments for flight test above
27.561	30	Emergency Landing Conditions		X	
27.561(b)3(i)	24	Emergency Landing Conditions – Up		X	
27.561(b)3(ii)	24	Emergency Landing Conditions – Fwd			Forward deflection or failure of basket poses no threat to occupants.
		N/A			
27.561(b)3(iii)	24	Emergency Landing Conditions – Side		X	
27.561(b)3(iv)	24	Emergency Landing Conditions – Down		X	27.337 Maneuvering Load is Critical.
		Analysis and Test iaw AC 43.13-1A			
		Compliance with 27.337			

Subpart D – Design and Construction

27.601	30	Design		X	Design is conventional.
27.603	30	Materials		X	Materials used are specified in Mil-Hdbk-5H.
27.605	30	Fabrication Methods		X	Design is conventional.
27.609	30	Protection of Structure		X	
27.611	30	Inspection Provisions		X	Design is easy to inspect.
27.613	30	Material Strength Properties and Design Values		X	
27.625	30	Fitting Factor		X	
		Analysis			
27.725	30	Limit Drop Test	N/A		Ref. TCDS Equivalent Safety Finding. Landing gear loads on fitting to be assessed by comparison with ultimate strength of original Type Approved fitting, and test as required.
27.727	30	Reserve Energy Absorption Drop Test	N/A		Installation does not block doors.
		N/A			
27.783	30	Doors	N/A		
27.787(a)	30	Cargo and Baggage Compartments	Compliance with 23.301 through 307	X	
27.787(b)	30	Cargo and Baggage Compartments	Design	X	Basket is a closed container.
27.787(c), (d)	30	Cargo and Baggage Compartments	N/A		Cargo is external to helicopter.

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

Airworthiness Requirement	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
Paragraph	Amdt.				
27.807	30	Emergency Exits		X	Installation does not block doors.
27.865(a)	30	External Load Attaching Means		X	
27.865(b), (c)	30	External Load Attaching Means			
27.865(d)	30	External Load Attaching Means			Failure of an attachment does not endanger the rotorcraft.
27.1387	30	Position Light System Dihedral Angles			No change from Type Approval.
27.1401	30	Anticollision Light System	X		Light located at FS 396, WL 130 on vertical fin. Basket has no significant effect on visibility of anticollision light.
Subpart G – Operating Limitations and Information					
27.1505	30	Never Exceed Speed	X		V _{NE} limits as specified in the existing Flight Manual (140 kts.)
27.1525	30	Kinds of Operation	X		Limited to VFR only.
27.1529	30	Instructions for Continuing Airworthiness	X		Maintenance instructions provided
27.1557(a)	30	Miscellaneous Markings and Placards – Baggage Compartments		X	
27.1557(b)	30	Miscellaneous Markings and Placards			
27.1557(c)	30	Miscellaneous Markings and Placards			
27.1557(d)	30	Miscellaneous Markings and Placards			
27.1581	30	Rotorcraft Flight Manual – General	X		
27.1583(c)	30	Operating Limitations – Weight and Loading Information	X		
27.1585	30	Operating Procedures	X		
27.1587	30	Performance Information	X		
27.1589	30	Loading Information	X		Placard installed on basket lid
Airworthiness Manual Requirements					
527.1581(e)		Rotorcraft Flight Manual – Units	X		



Department of Transport

Supplemental Type Certificate

This approval issued to:

AERO Design Ltd.
2013 - 39th Avenue NE
Calgary, Alberta
T2E 6R7

Approval Number: SH00-48

Issue Number.: 3

Date of Approval: 8 December, 2000

Date of Issue: 10 June, 2004

Responsible Office: Prairie and Northern

Aircraft / Engine Type: Bell

Model: 206L, L-1, L-3, L-4
407

Registration: All Eligible

Serial No.: All Eligible

Canadian Type Certificate or Equivalent: H-92

Description of Design Change: Installation Of Right Hand Cargo Basket / External Attachment Provisions

Required Equipment and Limitations:

Bell 407 Only:

Configuration A – External Cargo Basket Mounted Above Landing Gear

AERO Design Ltd. starboard mounted cargo basket to be completed in accordance with Transport Canada approved, AERO Design Ltd. Document Control List, DCL362, Rev. 2, dated 23 November 2000, or later approved revision. Applicable placard required on basket lid in accordance with installation drawing 36201.

Transport Canada approved AERO Design Ltd. Flight Manual Supplement FMS 362.01, Revision 1, dated 14 November 2000, is required with this installation.

AERO Design Ltd. Maintenance Manual Supplement MMS362.01, Revision 0, dated 15 November 2000, is required with this installation.

Basis of Certification is as defined by the applicable Type Certificate Data Sheets.

(see continuation sheet...)

Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated will not adversely affect the airworthiness of the modified product.

For the Minister of Transport

Continuation Sheet

Approval Number: SH00-48

Issue Number: 3

Date of Approval: 8 December, 2000

Date of Issue: 10 June, 2004

Approval Data (Continued):

NOTE: THIS ADDENDUM SHALL REMAIN PART OF THE CERTIFICATE REFERRED TO THEREIN.

Bell 407 Only (Continued):

Configuration B – External Cargo Basket Mounted Below Landing Gear

Installation of the Starboard Mounted Cargo Basket is to be completed in accordance with Transport Canada Approved, AERO Design Ltd., Document Control List DCL606, Revision 0, dated 31 May 2004, or later approved revision. High skid gear is required for the basket installation. Placard is required on the basket lid.

Transport Canada approved, AERO Design Ltd., Flight Manual Supplement FMS 606.01, Revision 0, dated 25 March 2004 is required with this installation.

External Attachment Provisions installed in accordance with drawing 60602 may remain installed if the basket installation is removed.

Basis of Certification is as defined by the applicable Type Certificate Data Sheets.

Bell 206L, L-1, L-3, L-4 Only:

Configuration A – External Attachment Provisions Only:

Installation of the External Attachment Provisions is to be completed in accordance with Transport Canada approved, AERO Design Ltd., Document Control List DCL493, Rev. 4, dated 3 June 2004 or later approved revision.

Transport Canada approved, AERO Design Ltd., Flight Manual Supplement FMS 493.01, dated 19 May 2002 is required with this installation.

Configuration B – Starboard Cargo Basket Installation:

Installation of Configuration A, External Attachment Provisions, is a prerequisite for installation of Configuration B, Starboard Cargo Basket Installation. Installation of the cargo basket is to be completed in accordance with Transport Canada Approved, AERO Design Ltd., Document Control List DCL492, Revision 3, dated 31 May 2004, or later approved revision. High skid gear is required for the basket installation. Placard is required on the basket lid.

Transport Canada approved, AERO Design Ltd., Flight Manual Supplement FMS 492.01, Revision 1, dated 25 June 2002 is required with this installation.

Basis of Certification is as defined by the applicable Type Certificate Data Sheets, plus FAR 27 at amendment 27-24.

Title: Side Mounted Cargo Basket

Approval: STC

Customer: AERO Design Ltd.

Type and Model: Bell 407

Definition Of Change:

Description:

In order to allow interchangeability of baskets, a new installation on the Bell 407 using the Bell 206L basket that has been approved is required. The installation on the Bell 407 would use the basket, beams, and similar attachment provisions as in the Bell 206L installation.

The forward landing gear fittings on the Bell 407 are the same as the 206L fittings, except that instead of a 1/4" bolt attaching the bottom support, 5/16" bolts are used.

The aft landing gear fittings are similar, except they are larger to accommodate a centre beam that allows some rotation of the landing gear cross tube. A block is installed in the fitting with a barrel nut to secure the bottom support, and a barrel nut to attach the basket beams, like in the forward fittings.

Previous flight tests from the Bell 206L and 407 baskets are intended to be used to establish the limits for this installation. The old 407 basket was larger than this basket (longer and taller), so using the limits from that installation are sufficient for this installation.

Primary Changes to the Aeronautical Product:

Installation of new forward landing gear fittings, installation of block in aft landing gear fittings, installation of beams and cargo basket on right side of helicopter.

Secondary Changes to the Aeronautical Product (Required as consequence of primary changes):

Other Relevant Modifications to the Aeronautical Product (Which impact on this change):

Substantial Change Evaluation:

The scope of this change is not substantial.

Significant Change Evaluation:

Refer to AMA 500/16, Appendix A, Tables A.2.1 through A.5.6, as applicable.

- Yes ☐ No ☒ The change is an example on the table of Significant Changes.
Yes ☒ No ☐ The change is close to an example on the table of Significant Changes.
Yes ☐ No ☒ The change is an example on the table of Not-Significant Changes.
Yes ☐ No ☒ The change is close to an example on the table of Not-Significant Changes.
Yes ☒ No ☐ The change is not an example on the tables.

Example found: "A fuselage modification that changes the primary structure, aerodynamics, or operating envelope sufficiently to invalidate certification assumptions."

Service experience with this type of installation has shown that only minor changes to the operating envelope are required. The primary structure is not changed.

- A. Is the general configuration changed? Yes ☐ No ☒

A change to the general configuration at the product level that is likely to require a new model designation because of the need to distinguish the different product with other product models (eg. performance, interchangeability of major components etc).

Comments:

- B. Are the principles of construction changed? Yes ☐ No ☒

A change at the product level to the materials and/or construction methods that affects the overall product's operating characteristics or inherent strength.

Comments:

- C. Have the assumptions used for certification been invalidated? Yes ☐ No ☒

Changes to product level assumptions, either design or engineering, associated with product development, compliance demonstration, performance or operating envelope that by themselves are so different, that the original assumptions are invalidated and the existing substantiation cannot be extrapolated to cover the changed product.

Comments:

Basis of Certification of the Basic Aeronautical Product:

Bell 407, TCDS H-92

FAR part 27, dated October 2, 1964 Amendment 27-1 through 27-30; Paragraph 27.561(b)(3) at Amdt 27-24; Section 27.563 at Amdt. 27-25; Section 27.785 at Amdt 27-24; Section 27.1093 at amendment 27-8; and Section 27.173 and 27.175 at amendment 27-1.

Exemptions to FAR 27 are the deletion of sections: 27.562, 27.1195, and 27.952(b)(1)

Basis of Certification for the Change to the Aeronautical Product:

Same as the original basis of certification on the Type Certificate Data Sheet.

Under the authority vested in me by the Minister, I have examined the change in type design listed above according to the established procedures and hereby determine that it is not significant pursuant to subsection 511.13(3) or 513.07(3) of the CARS, to the best of my knowledge and belief.

E. Burgoin, P. Eng., DAR 290M

30 March, 2004
Date

BELL 407

ROTORCRAFT FLIGHT MANUAL SUPPLEMENT for the **INSTALLATION of the AERO DESIGN CARGO BASKET**

Supplemental Type Certificate No. SH00-48

Sections I, II, III and IV of this document comprise the Transport Canada Approved sections of this Flight Manual Supplement. Compliance with Section I, Limitations, is mandatory.

Section V and any subsequent sections if present are Unapproved and are provided for information only.

The information and data contained in this Flight Manual Supplement supersede or supplement that contained in the basic Approved Flight Manual for the Bell 407 when fitted with the Cargo Basket. For limitations, procedures and performance not listed in this Flight Manual Supplement, refer to the Approved Flight Manual and other approved Flight Manual Supplements.

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I LIMITATIONS

1. The maximum load in the AERO Design Ltd. Cargo Basket is 200 Lb. (90.9 kg).
2. Flight operations limited to VFR conditions with AERO Design Ltd. Cargo Basket installed.
3. Maximum lateral or rearward speed limited to 25 KIAS.
4. Maximum winds from aft quadrants limited to 25 KIAS for takeoff, landing or hover flight.
5. V_{NE} is 140 KIAS except when the V_{NE} of the basic rotorcraft is more restrictive, in which case the lower V_{NE} applies.

II NORMAL PROCEDURES

1. Pre-flight inspections:
 - a) Ensure that all cargo stored in the cargo basket does not extend outside the basket, is properly tied down and secured for flight.
 - b) Ensure that the lid of cargo basket is closed and secured.

CAUTION

It is possible to exceed the lateral centre of gravity limits of the rotorcraft under some loading conditions. Pilots must ensure that lateral C of G is within limits when loading the basket.

III EMERGENCY PROCEDURES

No change from basic Approved Flight Manual.

CAUTION:

The rotorcraft glide angle is steeper than that of the basic helicopter when the AERO Design Ltd. Cargo Basket is installed.

IV PERFORMANCE

Climb performance may be reduced by up to 200 fpm.

Cruise speeds are reduced by approximately 10 kts. (11 mph).

V WEIGHT AND BALANCE

English Units

Item	Weight (Lb)	Longitudinal		Lateral	
		Arm (in)	Moment (in*Lb)	Arm (in)	Moment (in*Lb)
Cargo Basket Installation	66.0	113.3	7476	30.5	2013
Cargo	200 (MAX)	114.1	22820	38.5	7700

Metric Units

Item	Weight (Kg)	Longitudinal		Lateral	
		Arm (mm)	Moment (mm*Kg)	Arm (mm)	Moment (mm*Kg)
Cargo Basket Installation	30,0	2878	86 314	775	23 241
Cargo	90.9 (MAX)	2898	263 467	978	88 900

Longitudinal and Lateral moment arms are given only for the center of the Cargo Basket. Due to the length of the basket, some loading arrangements may require that actual moment arms be measured, to determine the correct moments about the center of gravity.

CAUTION:

It is possible to exceed lateral CG limits in some configurations. For example, with one pilot, no passengers, fuel tanks half empty, and the AERO Design Ltd. cargo basket loaded with 200 pounds of cargo, the Lateral CG of the rotorcraft could be out of limits.

AERO Design Ltd.

**MAINTENANCE INSTRUCTIONS
MI 606.01**

External Cargo Basket

Bell 407

Approved: E. Burgoin, P. Eng.

Prepared by: Jeff Clarke

Date: 20 April, 2004

AERO Design Ltd.: Mailing Address: 2013 39th Avenue N E, Calgary Alberta T2E 6R7
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1.0 INTRODUCTION

The Cargo Basket mounts to the side of the helicopter, supported by two beams bolted to the External Attachment Provisions. The provisions are incorporated into the landing gear fittings. The existing forward fittings are replaced, a block is installed in the aft fitting.

2.0 REFERENCE

AC43.13-1B

3.0 INSPECTION PROCEDURES

3.1 Basket

- Visually inspect tube to tube welds and mesh to tube welds every 100 hours for cracks, defects or other damage.
- Visually inspect basket mesh for damage every 100 hours.

3.2 Beams

- Visually inspect beams attaching basket to the helicopter every 100 hours for cracks, defects or other damage.
- Visually inspect bolts attaching the basket to the beams every 100 hours for security and damage.
- Visually inspect bolts attaching beams to external attachment provisions every 100 hours for security and damage.

3.3 External Attachment Provisions

- Visually inspect all landing gear fittings every 100 hours for cracks, defects or other damage.
- Visually inspect hardware attaching fittings to helicopter, and hardware attaching cross-tubes to fitting, every 100 hours for security and damage.

4.0 REPAIR PROCEDURES

4.1 Basket

Basket is fabricated from the following materials:

Lid and Rim:	3/4" x 0.035" square 4130 steel tube
Frames:	1/2" x 0.035" square 4130 steel tube
Mesh:	3/4" 18 ga. (0.040") expanded carbon steel mesh

Repair in accordance with AC43.13-1B, Chapter 4, as required.

4.2 Beams

DO NOT REPAIR MAJOR DAMAGE TO BEAMS. Replace beam if major damage is found.

- (a) Nicks and/or gouges on the top or bottom face up to 0.030" deep and 0.125" wide may be dressed out to a smooth contour.
- (b) Nicks and/or gouges on the side faces up to 0.060" deep and 0.125" wide may be dressed out to a smooth contour.
- (c) Nicks on the corners up to 0.125" deep may be dressed out.
- (d) For elongation of basket attachment holes (AN4 bolt):
 - 1. Ream hole to 0.375 (+0.0005/-0.0000)
 - 2. Insert NAS76A4-100 bushing
- (e) For elongation of helicopter attachment holes (AN6 bolt):
 - 1. Ream hole to 0.5000 (+0.0005/-0.0000)
 - 2. Insert NAS76A6-100 bushing

4.3 Landing Gear Attachment Fittings and Blocks

DO NOT REPAIR MAJOR DAMAGE TO FITTINGS OR BLOCKS. Replace External Attachment Fittings or blocks if major damage is found.

- (a) Nicks and/or gouges on any face up to 0.030" deep and 0.125" wide may be dressed out to a smooth contour. Touch up paint as required.
- (b) Do not repair elongation of provision bolt holes (AN6 bolt). Hole is nominally 0.391" in diameter with 1/4" maximum freedom of motion left and right.
- (c) Do not repair elongation of barrel nut holes. Hole is nominally 3/4" in diameter for beam attachment, 11/16" for landing gear saddle attachment (block only).

AERO Design Ltd.

**ENGINEERING REPORT
ER606.01**

SIDE MOUNTED CARGO BASKET

Bell 407

Approved: E. Burgoin, P. Eng.

Prepared by: Jeff Clarke

Revision 0

Date: 30 March, 2004

AERO Design Ltd.
Engineering Consultants

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1.0 INTRODUCTION

This report is for the substantiation of the side mounted cargo basket installation on the Bell 407, using the existing Bell 206L basket. The forward fittings to be used are the same as in the Bell 206L installation, except that the lower strap is attached with a 5/16" bolt instead of a 1/4" bolt. The aft attachment uses a block installed in the aft fitting.

2.0 REFERENCE

AERO Design Ltd. Drawings 60601, 60602

AERO Design Ltd. Engineering Reports ER492.01, ER492.02, ER493.01, ER493.03

MIL-HDBK-5

3.0 BASIS OF CERTIFICATION

Bell 407, TCDS H-92:

FAR part 27, dated October 2, 1964 Amendment 27-1 through 27-30; Paragraph 27.561(b)(3) at Amdt 27-24; Section 27.563 at Amdt. 27-25; Section 27.785 at Amdt 27-24; Section 27.1093 at amendment 27-8; and Section 27.173 and 27.175 at amendment 27-1.

Exemptions to FAR 27 are the deletion of sections: 27.562, 27.1195, and 27.952(b)(1).

This installation:

Same as the basis of certification as shown the Type Certificate Data Sheet.

4.0 ANALYSIS OF CURRENT AIRWORTHINESS DIRECTIVES (AD'S)

AD CF-2004-03 relates to high stresses imposed on the landing gear cross tubes during run on landings, and introduces an RIN (Retirement Index Number) on the landing gear cross tubes. This installation does not affect compliance with AD CF-2004-03.

Two AD's requiring a lower V_{NE} have been issued (CF-1998-36, CF-2001-01). CF-2001-01 has been rescinded. CF-1998-36 is still in effect. This installation does not affect compliance with AD CF-1998-36, as the flight manual supplement states that if the V_{NE} of the existing flight manual is more restrictive to use the lower value.

5.0 LOADS

BELL 407 HELICOPTER LOAD FACTORS, FAR 27:

FAR 27.561(b)(3)

Ultimate Upward Emergency Landing Load Factor:	$n_{e_up} := 1.5$
Ultimate Forward Emergency Landing Load Factor:	$n_{e_fwd} := 4.0$
Ultimate Sideward Emergency Landing Load Factor:	$n_{e_side} := 2.0$
Ultimate Downward Emergency Landing Load Factor:	$n_{e_down} := 4.0$

FAR 27.625 Fitting Factor (does not apply to articles being tested): $n_{ff} := 1.15$

FAR 27.303 Safety Factor: $n_{sf} := 1.5$

FAR 27.337(a) Limit Positive Maneuvering LoadFactor: $n_{man} := 3.5$

$n_{man_ult} := n_{man} \cdot n_{sf}$ Ultimate Positive Maneuvering LoadFactor: $n_{man_ult} = 5.25$

Limit Negative Maneuvering LoadFactor: $n_{man_n} := -1.0$

$n_{man_neg_u} := n_{man_n} \cdot n_{sf}$ Ultimate Negative Maneuvering LoadFactor: $n_{man_neg_u} = -1.5$

CRITICAL ULTIMATE LOAD FACTORS:

Downward:	Ultimate Positive Maneuvering LoadFactor:	$n_{man_ult} = 5.25$
Forward:	Ultimate Forward Emergency Landing Load Factor:	$n_{e_fwd} = 4.00$
Sideward:	Ultimate Sideward Emergency Landing Load Factor:	$n_{e_side} = 2.00$
Upward:	Ultimate Upward Emergency Landing Load Factor:	$n_{e_up} = 1.50$

Note: The basket is mounted below and to one side of the cabin. Forward deflection or failure in the emergency landing condition does not endanger the occupants. Likewise, Sideward and Upward deflection or failure of the basket in the emergency landing condition do not endanger the occupants.

Sideward and Upward Load Factors are used in the tests to ensure that the lid of the basket does not open in flight.

5.1 Inertia Loads

The loads on the basket were calculated in ER492.01. A summary follows.

$$W_{\text{basket}} := 55 \cdot \text{lbf}$$

Weight of basket

$$W_{\text{cargo}} := 200 \cdot \text{lbf}$$

Weight of cargo

$$W_{\text{beam}} := 10 \cdot \text{lbf}$$

Weight of beams (each)

$$W_{\text{total}} := (W_{\text{basket}} + W_{\text{cargo}} + 2 \cdot W_{\text{beam}})$$

$$W_{\text{total}} = 275 \cdot \text{lbf}$$

Total weight of basket installation

The aft beam is critical as the spacing on the helicopter attachments are closer on the aft beam than on the front beam.

Assuming 2/3 of cargo is at the aft end:

$$P_{\text{end}} := \frac{W_{\text{basket}}}{2} + \frac{2}{3} \cdot W_{\text{cargo}} + W_{\text{beam}}$$

$$P_{\text{end}} = 171 \cdot \text{lbf}$$

Load on one end of basket

$$P_{\text{ult}} := P_{\text{end}} \cdot n_{\text{man_ult}}$$

$$P_{\text{ult}} = 897 \cdot \text{lbf}$$

Ultimate load due to basket installation on aft beam

5.2 Drag Load

$$l_{\text{basket}} := 74 \cdot \text{in}$$

Length of basket.

$$w_{\text{basket}} := 22 \cdot \text{in}$$

Width of basket.

$$h_{\text{basket}} := 16 \cdot \text{in}$$

Height of basket.

$$A_f := w_{\text{basket}} \cdot h_{\text{basket}}$$

$$A_f = 0.227 \cdot \text{m}^2$$

Frontal Area of basket.

$$A_p := l_{\text{basket}} \cdot w_{\text{basket}}$$

$$A_p = 1.050 \cdot \text{m}^2$$

Planar Area of basket.

$$\frac{l_{\text{basket}}}{w_{\text{basket}}} = 3.4$$

Fineness ratio of basket

$$C_{Do} := 1.6$$

Drag Coefficient of Basket, (overestimated)
(Ref. Hoerner, Fluid Dynamic Drag, Figure 22).

$$\rho := 0.002378 \frac{\text{slug}}{\text{ft}^3}$$

Density of air at Sea Level.

$$V_{ne} := 140 \text{ knots}$$

Never-Exceed-Speed of Bell 407.
(Ref. Bell 407 Flight Manual.)

$$V_d := \frac{V_{ne}}{0.9}$$

$$V_d = 156 \text{ knots}$$

Design Dive Speed of Bell 407

$$\text{Drag} := \frac{\rho}{2} \cdot V_d^2 \cdot A_f C_{Do}$$

$$\text{Drag} = 321 \text{ lbf}$$

Drag on basket.

$$P_{\text{drag_ult}} := \text{Drag} \cdot n_{sf} \cdot n_{ff}$$

$$P_{\text{drag_ult}} = 553 \text{ lbf}$$

Ultimate applied Drag load on basket.

$$P_{\text{drag_test}} := \text{Drag} \cdot n_{sf}$$

$$P_{\text{drag_test}} = 481 \text{ lbf}$$

Ultimate Drag load on basket in Static Test.

$$AC_{\text{drag}} := 38.5 \text{ in}$$

Lateral Aerodynamic Center of basket.

6.0 STRUCTURAL COMPLIANCE

6.1 Basket

The basket was load tested. Refer to ER492.02 for load test. The drag load from this installation is higher as the design dive speed of the Bell 407 is higher than the Bell 206L. The required drag load to be tested is 481 lb. The basket was tested to 530 lb.

The basket has been considered and acceptable for this installation.

6.2 Beams

The attachments to the helicopter are closer together on the aft beam, therefore the aft beam is critical.

The aft beam was analyzed in ER492.01. The maneuvering loads are the same. The drag load is higher, as explained above. Therefore the beams must be checked for the higher drag load. Refer to ER492.01, section 5.3.4 for drag loads on the aft beam.

Point B is the inboard basket attachment and Point C is the right side fitting attachment.

Combined Bending Stress due to Manouvering Load and Drag Load at "B".

Ultimate Bending Moment at "B"
due to Manouvering Load.

$$M_{B_z} = 11345 \cdot \text{in} \cdot \text{lbf}$$

Moment of Inertia of beam cross section
at bolt "B" around the longitudinal axis.

$$I_{x_b} = 0.79 \cdot \text{in}^4$$

Distance from longitudinal neutral axis
to extreme fibre at point "B".

$$z_b = 1.060 \cdot \text{in}$$

Ultimate Bending Moment at "B"
due to Drag Load.

$$M_{B_{\text{drag}}} = 4769 \cdot \text{in} \cdot \text{lbf}$$

Moment of Inertia of beam cross section
at bolt "B" around the vertical axis.

$$I_{z_b} = 0.18 \cdot \text{in}^4$$

Distance from vertical neutral axis
to extreme fibre at point "B".

$$x_b = 0.500 \cdot \text{in}$$

$$f_{b_z} := \frac{M_{B_z} \cdot z_b}{I_{x_b}}$$

Vertical Bending stress applied to beam at "B". $f_{b_z} = 15.1 \cdot \text{ksi}$

$$f_{b_{\text{drag}}} := \frac{M_{B_{\text{drag}}} \cdot x_b}{I_{z_b}}$$

Drag Bending stress applied to beam at "B". $f_{b_{\text{drag}}} = 13.5 \cdot \text{ksi}$

$$f_{b_{\text{comb}}} := f_{b_z} + f_{b_{\text{drag}}}$$

Combined Bending stress applied to beam
at "B". (Stresses are additive in rectangular
cross-section, ref. Bruhn, A13) $f_{b_{\text{comb}}} = 28.6 \cdot \text{ksi}$

Ultimate Tensile Strength of 6061-T651
aluminum bar. (ref. Mil-Hdbk-5H)

$$F_{tu_{6061}} := 42 \cdot \text{ksi}$$

$$MS := \frac{F_{tu_{6061}}}{f_{b_{\text{comb}}}} - 1$$

Bending Margin of Safety.

$$MS = 0.47$$

Combined Bending Stress due to Manouvering Load and Drag Load at "C".

Ultimate Bending Moment at "C"
due to Manouvering Load.

$$M_{C_z} = 29137 \cdot \text{in} \cdot \text{lbf}$$

Moment of Inertia of beam cross section
at bolt "C" around the longitudinal axis.

$$I_{x_c} = 2.25 \cdot \text{in}^4$$

Distance from longitudinal neutral axis
to extreme fibre at point "C".

$$z_c = 1.500 \cdot \text{in}$$

Ultimate Bending Moment at "C"
due to Drag Load.

$$M_{C_{\text{drag}}} = 4769 \cdot \text{in} \cdot \text{lbf}$$

Moment of Inertia of beam cross section
at bolt "C" around the vertical axis.

$$I_{z_c} = 0.25 \cdot \text{in}^4$$

Distance from vertical neutral axis
to extreme fibre at point "C".

$$x_c = 0.500 \cdot \text{in}$$

$$f_{b_z} := \frac{M_{C_z} \cdot z_c}{I_{x_c}}$$

Vertical Bending stress applied to beam at "C". $f_{b_z} = 19.4 \cdot \text{ksi}$

$$f_{b_{\text{drag}}} := \frac{M_{C_{\text{drag}}} \cdot x_c}{I_{z_c}}$$

Drag Bending stress applied to beam at "C". $f_{b_{\text{drag}}} = 9.5 \cdot \text{ksi}$

$$f_{b_{\text{comb}}} := f_{b_z} + f_{b_{\text{drag}}}$$

Combined Bending stress applied to beam
at "C". (Stresses are additive in rectangular
cross-section, ref. Bruhn, A13) $f_{b_{\text{comb}}} = 29.0 \cdot \text{ksi}$

$$MS := \frac{F_{tu_{6061}}}{f_{b_{\text{comb}}}} - 1$$

Bending Margin of Safety. $MS = 0.45$

6.3 Attachment Provisions

6.3.1 Forward Fitting

The Bell part number for the 407 forward fitting is 407-030-111-101. It is dimensionally similar to the Bell 206L forward fitting 206-033-108-001, except the bolt attaching the strap is 5/16" diameter instead of 1/4" diameter. The strap assembly on the 407 forward fitting is the same strap used on the 206L aft fitting.

As the only difference is the strap hole diameter, and the Bell 407 fitting is otherwise the same as the Bell 206L fitting, the new approved Bell 206L forward fittings can be used, with 5/16" diameter holes for the strap attaching bolt. This is accomplished on drawing 60621.

Engineering Report ER493.01 addresses the strength of the fittings. Engineering Report 493.03 documents a test to allow the flange thickness to be reduced. The allowable loads determined from those reports are acceptable for this installation.

The forward fitting has been considered and is sufficient for this installation.

6.3.2 Aft Attachment

The Bell part number for the 407 aft fitting is 407-030-112-101. It is larger than the Bell 206L aft fitting, as it has to accommodate the aft cross tube beam support assembly. This beam assembly allows the aft cross tube to rotate about a pivot point in the centre. The forward and aft ends of the fitting have rectangular slots, which allows a block to be installed in the fitting (the forward fittings have rounded slots which are too small for blocks to fit inside).

The block is made from 6061-T6 aluminum, with stainless steel barrel nuts installed in slots in the block.

Structural compliance of the aft attachment is shown by test. The maneuvering load and drag load are applied simultaneously. See report ER606.02 for load test.

The block installed in the aft landing gear fitting, and the attaching bolt, were not permanently deformed in the test to ultimate load.

The aft attachment is acceptable.

APPENDIX A

CURRENT AD'S

Airworthiness Directives

Applicable to Canadian registered or manufactured aeronautical products

Database Last Updated: 2004-03-30

Directives Pertaining to Model: **BELL TEXTRON - CAN, 407**

34 ADs found

Ctry:	AD Number:	AD Subject:	SB Reference:
CF	<u>CF-2004-03</u>	407 SERIES - LANDING GEAR CROSS TUBES	407-03-59
CF	<u>CF-2003-10</u>	407 MODEL-TAIL ROTOR GEARBOX CASE OIL FEED GALLERY	ASB 407-03-57 REV B
CF	<u>CF-2002-46</u>	EMERGENCY AD - BELL 407 - SWASHPLATE DRIVE LINK	ASB 407-02-55
CF	<u>CF-2002-32R1</u>	BELL 407 - TAIL ROTOR GEARBOX SUPPORT CASTING	ASB 407-02-53
CF	<u>CF-2002-18R3</u>	BELL 407 - TAIL ROTOR DRIVE SHAFT BEARINGS	VARIOUS
CF	<u>CF-2002-03R2</u>	BELL 206L-4, 407 AND 427 - KAFLEX DRIVE SHAFT	ASB 407-01-45 REV A
CF	<u>CF-2001-34</u>	407 SERIES - FUEL FILLER CAP ELECTRICAL BONDING	407-01-41
CF	<u>CF-2001-32</u>	FORWARD BEARING HANGER SUPPORT	407-01-39
CF	<u>CF-2001-30R1</u>	MAIN FUEL FEED LINE	407-01-42
CF	<u>CF-2001-24</u>	K-FLEX SHAFT - - REFERENCE CF-2002-03	ASB 407-01-43
CF	<u>CF-2001-01R1</u>	NEVER-EXCEED SPEED (VNE) REDUCTION	
CF	<u>CF-2000-09R1</u>	BELL 407 - HORIZONTAL STABILIZER SLATS	ASB 407-99-32
CF	<u>CF-2000-02</u>	CANCELLATION NOTICE - AD SUPERSEDED BY CF-2002-18	
CF	<u>CF-99-25</u>	CREW SEAT BELT	407-99-29
CF	<u>CF-99-19</u>	DOOR LATCH MECHANISM BASEPLATE ASSEMBLY	407-99-30
CF	<u>CF-99-08</u>	OIL COOLER BLOWER BEARINGS	407-98-23
CF	<u>CF-99-04</u>	AIRWORTHINESS LIMITATIONS	
CF	<u>CF-99-02</u>	MAIN ROTOR PITCH HORN ASSEMBLY	407-99-25
CF	<u>CF-1999-17R2</u>	TAILBOOM INSPECTION	ASB 407-99-26 REV B
CF	<u>CF-98-28</u>	HYDRAULIC RELIEF VALVE	ASB 407-98-20
CF	<u>CF-98-25R1</u>	REPLACEMENT OF DRIVE SHAFT P/N 206-340-300-103	ASB 407-98-19
CF	<u>CF-98-19</u>	DOOR LATCH ROD ASSEMBLY	407-98-18
CF	<u>CF-98-15</u>	EXTERNAL RESCUE SYSTEMS	CAR 702.21
CF	<u>CF-98-13</u>	FADEC FAIL WARNING HORN	407-97-12
CF	<u>CF-98-10R1</u>	VERTICAL FIN	ASB 407-98-17REV A

CF	<u>CF-98-06</u>	MANUAL CARGO HOOK RELEASE	407-98-16
CF	<u>CF-1998-36R7</u>	MINIMIZE RISK OF TAIL BOOM STRIKE DURING FLIGHT	407-99-27RA
CF	<u>CF-1998-09R1</u>	TAIL ROTOR GEARBOX ATTACHMENT NUTS	ASB 407-97-14 REV C
CF	<u>CF-97-22</u>	SWASHPLATE DUPLEX BEARING	ASB 407-97-11
CF	<u>CF-97-20R1</u>	THOMAS COUPLING - CANCELLATION OF 25 HOUR INSP	
CF	<u>CF-97-19</u>	INSPECT T/R ASSY COUPLINGS.CHECK OIL COOLER BRAK	407-97-7
CF	<u>CF-97-15</u>	MIN FUEL FLOW OVERSPEED VALVE- FLIGHT MANUAL AMEND	CEB-A-73-6015
CF	<u>CF-97-08</u>	TAIL ROTOR HANGER BEARING SUPPORT GAP	ASB 407-97-7
CF	<u>CF-96-19R4</u>	ACTION REQ'D TO RETURN FLEET BACK TO FLIGHT STATUS	OSN 407-96-1

AERO Design Ltd.

**ENGINEERING REPORT
ER606.02**

SIDE MOUNTED CARGO BASKET

Load Test

Bell 407

Approved: E. Burgoin, P. Eng.

Prepared by: Jeff Clarke

Revision 0
Date: 01 April, 2004

AERO Design Ltd.
Engineering Consultants

2013 – 39th Avenue N.E., Calgary, Alberta T2E 6R7
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1.0 INTRODUCTION

This report is to document the load test of the support beams and rear attachment fittings. The test is to demonstrate that using blocks in the aft fitting will carry the load of the cargo basket, and to demonstrate that the support beams will carry the loads when made from 6061-T6 Aluminum.

2.0 REFERENCE

AERO Design Ltd. engineering report ER606.01

AERO Design Ltd. drawings 60602 and 60620

3.0 LOADS

The loads were determined in ER606.01. A summary follows.

3.1 Drag Load

Assume both beams resist the basket drag equally:

(From ER 606.01, Section 5.2)

Ultimate drag load on basket = 481 Lb

Ultimate drag load per beam = 240 Lb

3.2 Maneuvering Load

Assume all cargo is at one end of the basket:

Weight of Basket = 55 Lb / 2

Weight of Cargo (max) = 200 Lb

Weight of Beam = 10 Lb

Total Weight on one beam = 237.5 Lb

Maneuvering Load Factor = 3.5

Ultimate Load Factor = 1.5

Ultimate maneuvering load = $238 \text{ Lb} \times 3.5 \times 1.5 = 1247 \text{ lb.}$

4.0 TEST SETUP

A landing gear attachment block was fabricated in accordance with drawing 60620. A scrap Bell 407 aft landing gear fitting was used for the test with the block installed as shown on drawing 60602. The landing gear fitting was then attached to a heavy steel channel to support the beam, as it would be installed on the helicopter. The fitting closest to the basket is critical.

A support beam from the previous Bell 407 cargo basket installation (reference installation drawing 36201) was used for this test. It had been scrapped due to a manufacturing error, but it had suitable cross-section for the test. The beam was modified to match the dimensions shown in drawing 49221. See Figure 1 below for the modification.

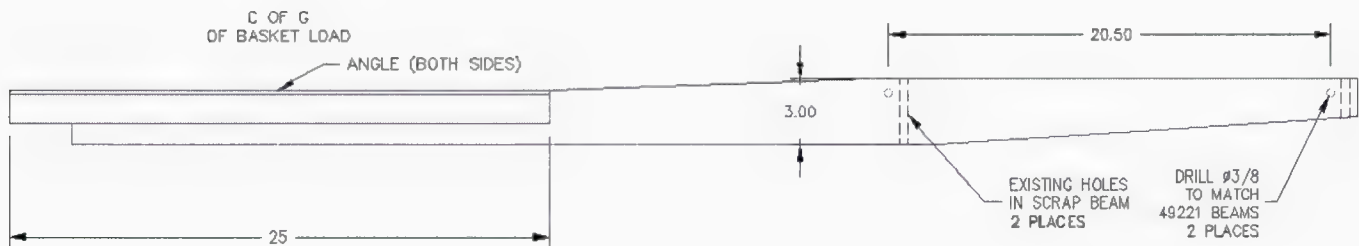


Figure 1 – Support Beam

The drag load was applied with an eye ring bolted to the beam at the lateral centre of the basket, pulled with a come-along. The maneuvering load was applied by stacking bags of lead shot on the end of the beam, with the centre of gravity at the lateral centre of gravity of the basket. Angles were attached to the sides of the beam (see Figure 1) to support a plywood platform to stack the bags of lead shot.

The assembly was installed on a large I beam, with the support beam extending off the end. The channel section with the landing gear fitting was welded to the end of the I beam. A pair of angles were welded to the I beam to secure the other support beam attachment with a 3/8 bolt.

5.0 TEST

The maneuvering and drag loads were applied simultaneously. The come-along was pulled until the load cell read 310 lb (see figure 3). Fifty bags of lead shot, each weighing 25 lb (1250 lb. total), were stacked on the board.

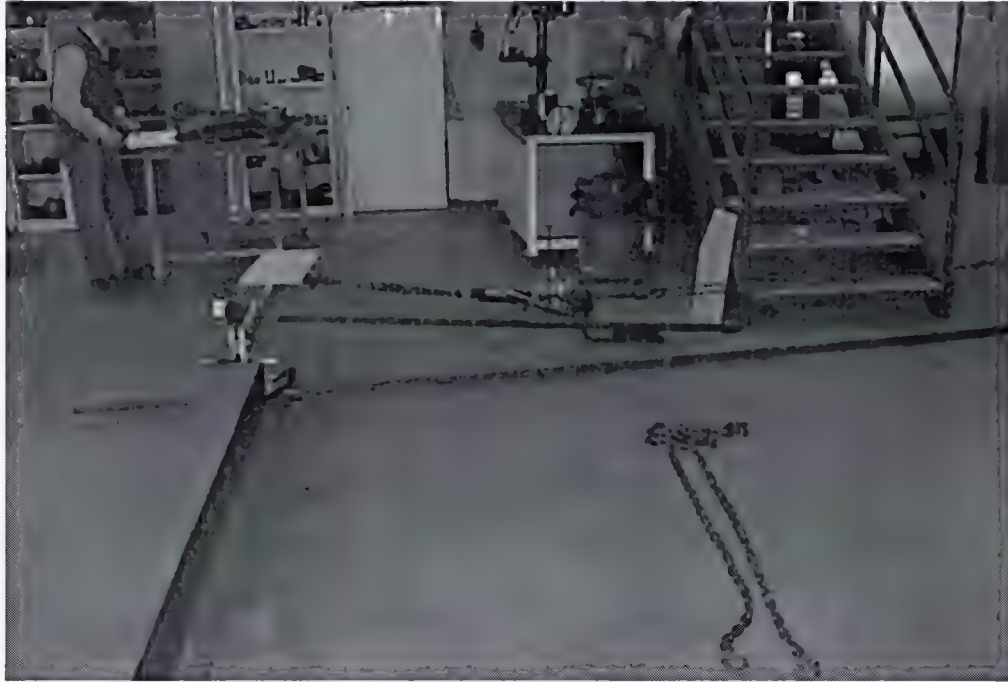


Figure 2 – Test Setup

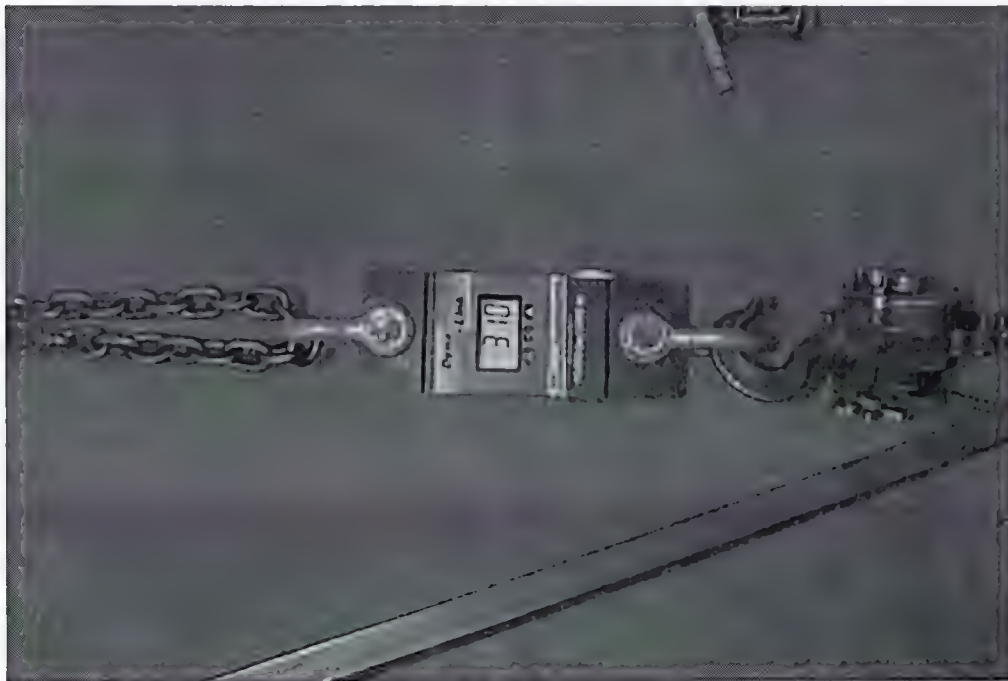


Figure 3 – Drag Load



Figure 4 – Maneuvering Load (Side View)



Figure 5 – Maneuvering Load (End View)

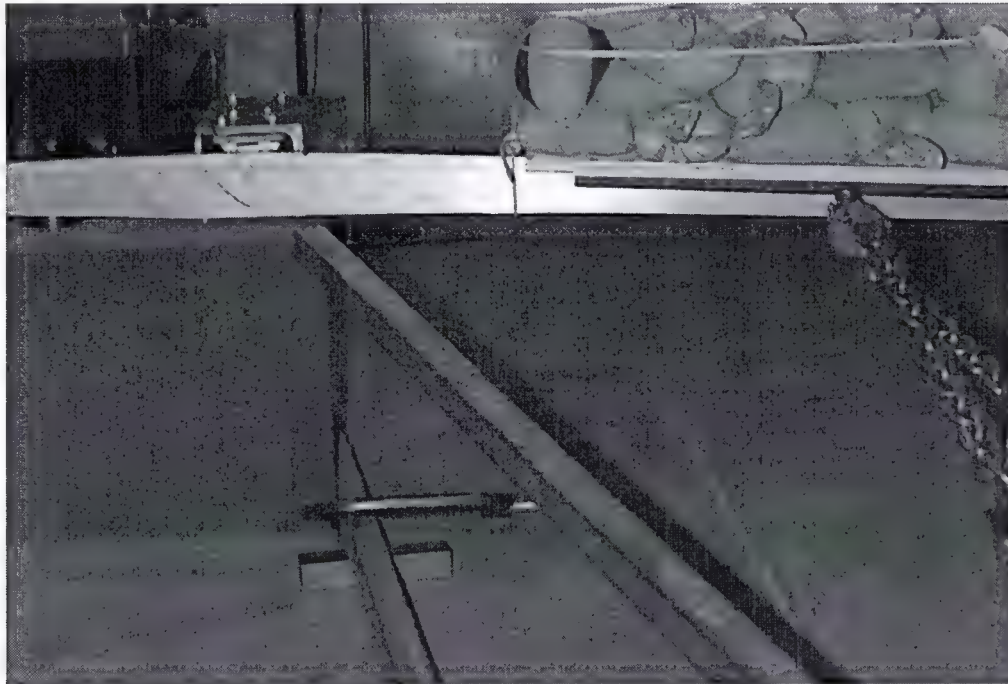


Figure 6 – Deflection Due to Maneuvering Load

Applied Manouvering Load = 1250 pounds > 1247 pounds
Applied Drag Load = 310 pounds > 240 pounds

The beam and attachment fitting with block installed carried the applied loads without failure. After the bags of lead and the drag load were removed, the beam was checked for permanent deformation. There was no permanent deformation found.

The bolt securing the block into the landing gear fitting was not deformed.

AERO DESIGN LTD.

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4 May, 2004

E&B Helicopters
P.O. Box 1000
Campbell River, BC
Canada
V9W 6Y4

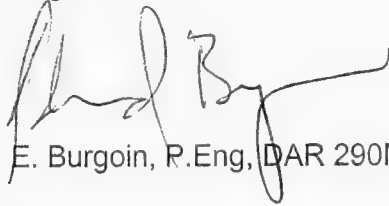
Attn: Ed Wilcock

Re: Bell 407 Cargo Basket Installation

Please find attached the following parts to complete the installation package:

Lid Support Brace (modified)	36280-01	Qty – 1
Barrel Nut (for forward landing gear fittings)	49320-01	Qty – 2
Bolt (for aft landing gear fittings)	NAS6206-11	Qty – 2

Regards,



E. Burgoin, R.Eng, DAR 290M

Encl.

AERO DESIGN LTD.

2013 – 39th Ave N. E., Calgary, Alberta, T2E 6R7

aerodesign@telusplanet.net

F A X C O V E R S H E E T

DATE: April 30, 2004

TIME: 1:58 PM

TO: Ed / Kerry

PHONE: 250-287-4421

E&B Helicopters

FAX: 250-287-4352

FROM: J. Clarke
Aero Design Ltd.

PHONE: 403-250-8027

FAX: 403-250-8333

Number of pages including cover sheet: 6

RE: BELL 407 CARGO BASKET FMS

Ed/Kerry,

Attached is the flight manual supplement for the Bell 407 Cargo Basket Installation.


Jeff

(For Ted Burgoin)

Aero Design

From: "Pamela Horton" <pamela_horton@mmaero.com>
To: "Aero Design" <aerodesign@telusplanet.net>
Sent: Wednesday, April 28, 2004 3:40 PM
Subject: Re: Quote Request

Hi Jeff

Do you have anything else you might need ? You have a \$ 100 PO Min since your company pays with a credit card. Ugh.

If nothing else to add....

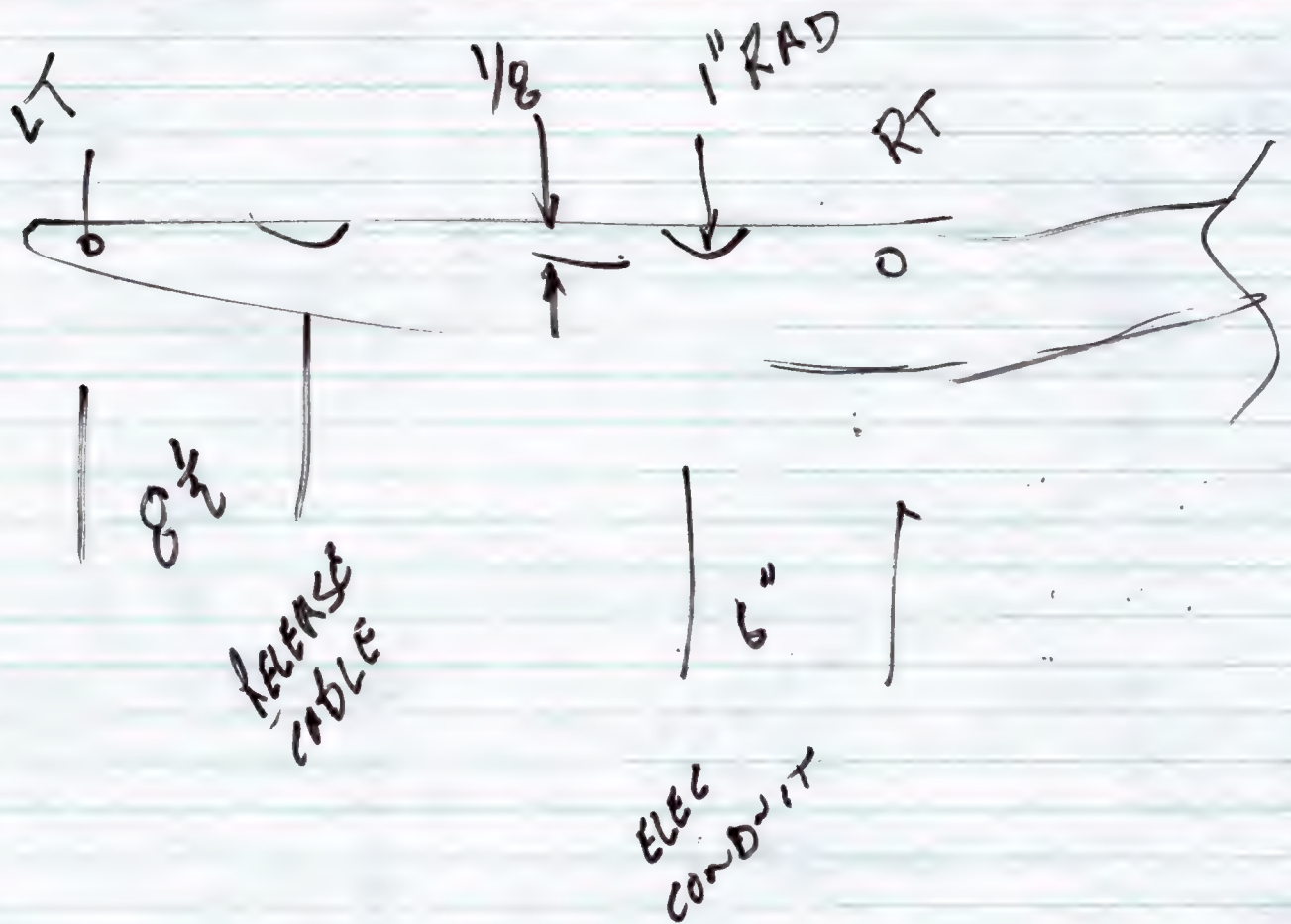
10 @ \$ 10.00ea
100 @ \$ 1.00ea
200 @ \$.50ea
400 @ \$.25ea

Stock

Thanks
Pamela

At 05:20 PM 4/28/2004, you wrote:

>Pamela,
>
>Please provide a quote for the following part, Screw Locking Helical Coil
>Insert.
>
>MS21209F6-15, qty 10
>
>Thank you,
>
>Jeff Clarke
>Technoligist
>
>Aero Design
>2013 - 39 Avenue NE
>Calgary, AB
>T2E 6R7
>ph: 403 250 8027
>fax: 403 250 8333



FWD BEAM

Do on 206 + 407 BEAM.

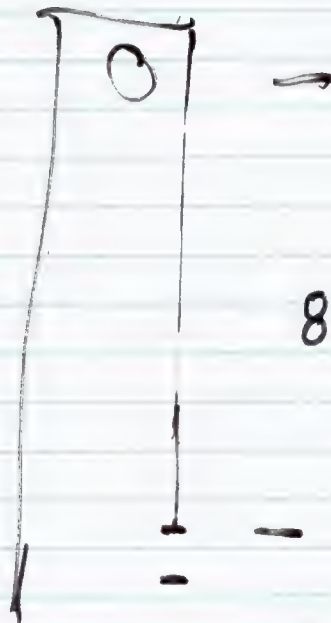


Handwritten text, possibly a signature or a set of initials, located in the middle-right area of the page.

Handwritten text, possibly a signature or a set of initials, located in the bottom-left area of the page.

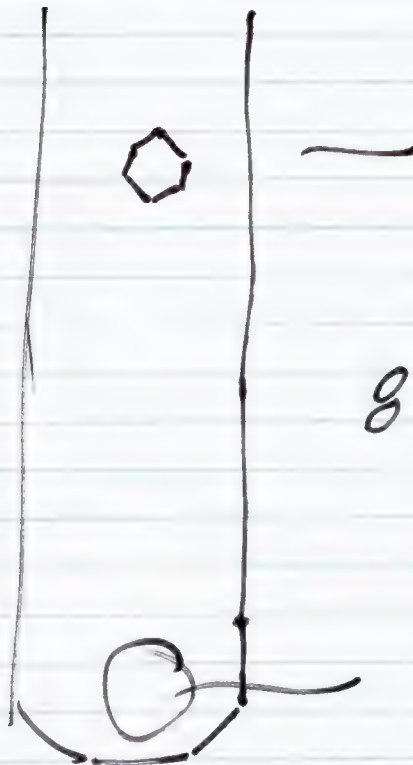
~~1. \$13~~

- PROOF
- 2 Barrel Nuts
- 2 NUTS BOLTS.



$8\frac{1}{8}$

move slot
up 1"
w $7\frac{1}{8}$



$8\frac{3}{8}$

Move bolt
Down 1"
w $7\frac{3}{8}$

Federal Aviation Regulation

▼ Sec. 27.1587

Part 27 AIRWORTHINESS STANDARDS: NORMAL CATEGORY ROTORCRAFT	
Subpart G--Operating Limitations and Information	Rotorcraft Flight Manual and Approved Manual Material

Sec. 27.1587

Performance information.

(a) The rotorcraft must be furnished with the following information, determined in accordance with Secs. 27.51 through 27.79 and 27.143(c):

✓ (1) Enough information to determine the limiting height-speed envelope.

(2) Information relative to--

✓ (i) The hovering ceilings and the steady rates of climb and descent, as affected by any pertinent factors such as airspeed, temperature, and altitude;

[(ii) The maximum safe wind for operation near the ground. *→ New* If there are combinations of weight, altitude, and temperature for which performance information is provided and at which the rotorcraft cannot land and takeoff safely with the maximum wind value, those portions of the operating envelope and the appropriate safe wind conditions shall be identified in the flight manual;

N/A (iii) For reciprocating engine-powered rotorcraft, the maximum atmospheric temperature at which compliance with the cooling provisions of Secs. 27.1041 through 27.1045 is shown; and

*** (iv) Glide distance as a function of altitude when autorotating at the speeds and conditions for minimum rate of descent and best glide as determined in Sec. 27.71.]

(b) The Rotorcraft Flight Manual must contain--

[(1) In its performance information section any pertinent information concerning the takeoff weights and altitudes used in compliance with Sec. 27.51; and

(2) The horizontal takeoff distance determined in accordance with Sec. 27.65 (a)(2)(i).]

Amdt. 27-21, Eff. 12/6/84

► Comments

▼ Document History

Notice of Proposed Rulemaking Actions:

Notice of Proposed Rulemaking. Notice No. 82-12; Issued on 04/29/82.

Final Rule Actions:

Final Rule. Docket No. 23266; Issued on 08/14/84.

Federal Aviation Regulation

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▼ Sec. 27.1587

Part 27 AIRWORTHINESS STANDARDS: NORMAL CATEGORY ROTORCRAFT	
Subpart G--Operating Limitations and Information	Rotorcraft Flight Manual and Approved Manual Material

Sec. 27.1587

Performance information.

- (a) The rotorcraft must be furnished with--
 - (1) Enough information to determine the limiting height-speed envelope; and
 - (2) Information relative to--
 - (i) The hovering ceilings and the steady rates of climb and descent, as affected by any pertinent factors such as airspeed, temperature, and altitude;
 - (ii) The maximum safe wind for operation near the ground.
- (b) The Rotorcraft Flight Manual (if provided) must contain--
 - (1) In its performance information section any pertinent information concerning the takeoff weights and altitudes used in compliance with Sec. 27.51; and
 - (2) In its operating procedures section--
 - (i) Any pertinent information concerning the takeoff procedure, including the kind of takeoff surface used in the tests and each appropriate climb-out speed; and
 - (ii) Any pertinent landing procedures, including the kind of landing surface used in the tests and appropriate approach and glide airspeeds.

► Comments

▼ Document History

Notice of Proposed Rulemaking Actions:

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Final Rule Actions:

Final Rule. Docket No. 5074; Issued on 10/02/64.

27-21

Federal Aviation Regulation▼ **Sec. 27.1585**

Part 27 AIRWORTHINESS STANDARDS: NORMAL CATEGORY ROTORCRAFT	
Subpart G--Operating Limitations and Information	Rotorcraft Flight Manual and Approved Manual Material

Sec. 27.1585

Operating Procedures.

✓ [(a) Parts of the manual containing operating procedures must have information concerning any normal and emergency procedures and other information necessary for safe operation, including takeoff and landing procedures and associated airspeeds. The manual must contain any pertinent information including--

WAS [NEW] (1) The kind of takeoff surface used in the tests and each appropriate climbout speed; and

W [NEW] (2) The kind of landing surface used in the tests and appropriate approach and glide airspeeds.]

✓ (b) For multiengine rotorcraft, information identifying each operating condition in which the fuel system independence prescribed in Sec. 27.953 is necessary for safety must be furnished, together with instructions for placing the fuel system in a configuration used to show compliance with that section.

NA (c) For helicopters for which a V_{NE} (power-off) is established under Sec. 27.1505(c), information must be furnished to explain the V_{NE} (power-off) and the procedures for reducing airspeed to not more than the V_{NE} (power-off) following failure of all engines.

NEW NA (d) For each rotorcraft showing compliance with Sec. 27.1353(g)(2) or (g)(3), the operating procedures for disconnecting the battery from its charging source must be furnished.

NA (e) If the unusable fuel supply in any tank exceeds five percent of the tank capacity, or one gallon, whichever is greater, information must be furnished which indicates that when the fuel quantity indicator reads "zero" in level flight, any fuel remaining in the fuel tank cannot be used safely in flight.

NA (f) Information on the total quantity of usable fuel for each fuel tank must be furnished.

✱ [(g) The airspeeds and rotor speeds for minimum rate of descent and best glide angle as prescribed in Sec. 27.71 must be provided.]

Amdt. 27-21, Eff. 12/6/84

► **Comments**▼ **Document History****Notice of Proposed Rulemaking Actions:**

Notice of Proposed Rulemaking. Notice No. 82-12; Issued on 04/29/82.

Final Rule Actions:

Final Rule. Docket No. 23266; Issued on 08/14/84.

Federal Aviation Regulation

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▼ Sec. 27.1585

Part 27 AIRWORTHINESS STANDARDS: NORMAL CATEGORY ROTORCRAFT	
Subpart G--Operating Limitations and Information	Rotorcraft Flight Manual and Approved Manual Material

Sec. 27.1585

Operating procedures.

[(a) Parts of the manual containing operating procedures must have information concerning any normal and emergency procedures, and other information necessary for safe operation, including takeoff and landing procedures and associated airspeeds.

(b) For multiengine rotorcraft, information identifying each operating condition in which the fuel system independence prescribed in Sec. 27.953 is necessary for safety must be furnished, together with instructions for placing the fuel system in a configuration used to show compliance with that section.]

Amdt. 27-1, Eff. 6/4/67

► Comments**▼ Document History**

Notice of Proposed Rulemaking Actions:

Notice of Proposed Rulemaking. Notice No. 65-43; Issued on 12/28/65.

Final Rule Actions:

Final Rule. Docket 7095; Issued on 04/28/67.

27-27

Federal Aviation Regulation▼ **Sec. 27.787**

Part 27 AIRWORTHINESS STANDARDS: NORMAL CATEGORY ROTORCRAFT	
Subpart D--Design and Construction	Personnel and Cargo Accommodations

Sec. 27.787

Cargo and baggage compartments.

- ✓ (a) Each cargo and baggage compartment must be designed for its placarded maximum weight of contents and for the critical load distributions at the appropriate maximum load factors corresponding to the specified flight and ground load conditions, except the emergency landing conditions of Sec. 27.561.
- ✓ (b) There must be means to prevent the contents of any compartment from becoming a hazard by shifting under the loads specified in paragraph (a) of this section.
- * [(c) Under the emergency landing conditions of Sec. 27.561, cargo and baggage compartments must--
 - (1) Be positioned so that if the contents break loose they are unlikely to cause injury to the occupants or restrict any of the escape facilities provided for use after an emergency landing; or
 - (2) Have sufficient strength to withstand the conditions specified in Sec. 27.561 including the means of restraint, and their attachments, required for the maximum authorized weight of cargo and baggage at the critical loading distribution.]
- ✓ (d) If cargo compartment lamps are installed, each lamp must be installed so as to prevent contact between lamp bulb and cargo.

Amdt. 27-27, Eff. 10/22/90

► **Comments**▼ **Document History****Notice of Proposed Rulemaking Actions:**Notice of Proposed Rulemaking. Notice No. 89-10; Issued on 04/19/89.**Final Rule Actions:**Final Rule. Docket No. 25885; Issued on 09/17/90.

27-11

Federal Aviation Regulation

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▼ **Sec. 27.787**

Part 27 AIRWORTHINESS STANDARDS: NORMAL CATEGORY ROTORCRAFT	
Subpart D--Design and Construction	Personnel and Cargo Accommodations

Sec. 27.787

Cargo and baggage compartments.

- (a) Each cargo and baggage compartment must be designed for its placarded maximum weight of contents and for the critical load distributions at the appropriate maximum load factors corresponding to the specified flight and ground load conditions, except the emergency landing conditions of Sec. 27.561.
- (b) There must be means to prevent the contents of any compartment from becoming a hazard by shifting under the loads specified in paragraph (a) of this section.
- (c) There must be means to protect each occupant from injury by the contents of any compartment when the ultimate forward inertia force is 4g.
- [(d) If cargo compartment lamps are installed, each lamp must be installed so as to prevent contact between lamp bulb and cargo.]

Amdt. 27-11, Eff. 2/1/77

► **Comments**▼ **Document History****Notice of Proposed Rulemaking Actions:**

Notice of Invitation to Submit Proposals; Notice No. 74-5; Issued on 2/14/74.
 Notice of Compilation of Proposals; Notice No. 74-5A; Issued on 5/22/74.
 Notice of Availability of Agenda; Notice No. 74-5B; Issued on 10/3/74.
 Notice of Clarifying Revisions; Notice No. 74-33; Issued on 10/3/74.
 Notice of Conference; Notice No. 74-5C; Issued on 11/25/74.
 Notice of Availability of Conference Summary; Notice No. 74-5D; Issued on 2/4/75.
 Notice of Airworthiness Review Program No. 2; Notice No. 75-10; Issued on 2/27/75.
 Notice of Airworthiness Review Program No. 3; Notice No. 75-19; Issued on 5/13/75.
 Notice of Airworthiness Review Program No. 4; Notice No. 75-20; Issued on 5/13/75.
 Notice of Airworthiness Review Program No. 5; Notice No. 75-23; Issued on 5/19/75.
 Notice of Airworthiness Review Program No. 6; Notice No. 75-25; Issued on 5/29/75.
 Notice of Airworthiness Review Program No. 7; Notice No. 75-26; Issued on 6/9/75.
 Notice of Airworthiness Review Program No. 8; Notice No. 75-31; Issued on 6/30/75.

Final Rule Actions:

27-21

Federal Aviation Regulation

▼ Sec. 27.143

Part 27 AIRWORTHINESS STANDARDS: NORMAL CATEGORY ROTORCRAFT	
Subpart B--Flight	Flight Characteristics

Sec. 27.143

Controllability and maneuverability.

(a) The rotorcraft must be safely controllable and maneuverable--

(1) During steady flight; and ✓

(2) During any maneuver appropriate to the type, including-- ✓

(i) Takeoff; ✓

(ii) Climb; ✓

(iii) Level flight; ✓

(iv) Turning flight; ✓

(v) Glide; ✓

(vi) Landing (power on and power off); and ✓

(vii) Recovery to power-on flight from a balked autorotative approach. ✓

(b) The margin of cyclic control must allow satisfactory roll and pitch control at V_{NE} with--

(1) Critical weight; ✓

(2) Critical center of gravity; ✓

(3) Critical rotor r.p.m.; and ✓

(4) Power off (except for helicopters demonstrating compliance with paragraph (e) of this section) and power on. ✓

(c) A wind velocity of not less than 17 knots must be established in which the rotorcraft can be operated without loss of control on or near the ground in any maneuver appropriate to the type (such as crosswind takeoffs, sideward flight, and rearward flight), with-- ✓

(1) Critical weight; ✓

(2) Critical center of gravity; ✓

(3) Critical rotor r.p.m.; and ✓

(4) Altitude, from standard sea level conditions to the maximum altitude capability of the rotorcraft or 7,000 feet, whichever is less. ✓

(d) The rotorcraft, after (1) failure of one engine in the case of multiengine rotorcraft that meet Transport Category A engine isolation requirements, or (2) complete engine failure in the case of other rotorcraft, must be controllable over the range of speeds and altitudes for which certification is requested when such power failure occurs with maximum continuous power and critical weight. No corrective action time delay for any condition following power failure may be less than--

(i) For the cruise condition, one second, or normal pilot reaction time (whichever is greater); and

(ii) For any other condition, normal pilot reaction time.

(e) For helicopters for which a V_{NE} (power-off) is established under Sec. 27.1505(c), compliance must be demonstrated with the following requirements with critical weight, critical center of gravity, and critical rotor r.p.m.:(1) The helicopter must be safely slowed to V_{NE} (power-off), without exceptional pilot skill, after the last operating engine is made inoperative at power-on V_{NE} .(2) At a speed of 1.1 V_{NE} (power-off), the margin of cyclic control must allow satisfactory roll and pitch

control with power off.

Federal Aviation Regulation

This Section of FAR is No Longer Current.
Click "[Here](#)" to go to FAR database and search for current section.

▼ Sec. 27.143

Part 27 AIRWORTHINESS STANDARDS: NORMAL CATEGORY ROTORCRAFT	
Subpart B--Flight	Flight Characteristics

Sec. 27.143

Controllability and maneuverability.

(a) The rotorcraft must be safely controllable and maneuverable--

(1) During steady flight; and

(2) During any maneuver appropriate to the type, including--

(i) Takeoff;

(ii) Climb;

(iii) Level flight;

(iv) Turning flight;

(v) Glide;

(vi) Landing (power on and power off); and

(vii) Recovery to power-on flight from a balked autorotative approach.

(b) The margin of cyclic control must allow satisfactory roll and pitch control at V_{NE} with--

(1) Maximum weight;

(2) Critical center of gravity;

(3) Critical rotor r.p.m.; and

(3) Power on and power off.

(c) A wind velocity of not less than 20 miles per hour must be established in which the rotorcraft can be operated without loss of control on or near the ground in any maneuver appropriate to the type (such as crosswind takeoffs, sideward flight, and rearward flight), with--

(1) Critical weight;

(2) Critical center of gravity; and

(3) Critical rotor r.p.m.

(d) The rotorcraft, after power failure, must be controllable over the range of speeds and altitudes for which certification is requested when the power failure occurs with maximum continuous power and critical weight. No corrective action time delay for any condition following power failure may be less than--

(1) For the cruise condition, one second, or normal pilot reaction time (whichever is greater); and

(2) For any other condition, normal pilot reaction time.

► Comments

▼ Document History

Federal Aviation Regulation

▼ Sec. 27.141

Part 27 AIRWORTHINESS STANDARDS: NORMAL CATEGORY ROTORCRAFT	
Subpart B--Flight	Flight Characteristics

Sec. 27.141

General.

The rotorcraft must--

[(a) Except as specifically required in the applicable section meet the flight characteristics requirements of this subpart--

- ADDED
- (1) At the altitudes and temperatures expected in operation;
 - (2) Under any critical loading condition within the range of weights and centers of gravity for which certification is requested;
 - (3) For power-on operations, under any condition of speed, power, and rotor r.p.m. for which certification is requested; and
 - (4) For power-off operations, under any condition of speed and rotor r.p.m. for which certification is requested that is attainable with the controls rigged in accordance with the approved rigging instructions and tolerances;
- (b) Be able to maintain any required flight condition and make a smooth transition from any flight condition to any other flight condition without exceptional piloting skill, alertness, or strength, and without danger of exceeding the limit load factor under any operating condition probable for the type, including--
- (1) Sudden failure of one engine, for multiengine rotorcraft meeting Transport Category A engine isolation requirements of Part 29 of this chapter; and
 - (2) Sudden, complete power failure, for other rotorcraft; and
 - (3) Sudden, complete control system failures specified in Sec. 27.695 of this Part; and
- (c) Have any additional characteristic required for night or instrument operation, if certification for those kinds of operation is requested. Requirements for helicopter instrument flight are contained in Appendix B of this Part.

Amdt. 27-21, Eff. 12/6/84

► Comments

▼ Document History

Notice of Proposed Rulemaking Actions:

Notice of Proposed Rulemaking. Notice No. 82-12; Issued on 04/29/82.

Final Rule Actions:

Final Rule. Docket No. 23266; Issued on 08/14/84.

Federal Aviation Regulation

This Section of FAR is No Longer Current.
Click "[Here](#)" to go to FAR database and search for current section.

▼ Sec. 27.141

Part 27 AIRWORTHINESS STANDARDS: NORMAL CATEGORY ROTORCRAFT	
Subpart B--Flight	Flight Characteristics

Sec. 27.141

General.

The rotorcraft must--

(a) Except as specifically required in the applicable section meet the requirements of this section and of Secs. 27.143, 27.161, and 27.171 through 27.175--

(1) At the normally expected operating altitudes;

(2) Under any critical loading condition within the range of weights and centers of gravity for which certification is requested;

(3) For power-on operations, under any condition of speed, power, and rotor r.p.m. for which certification is requested; and

(4) For power-off operations, under any condition of speed and rotor r.p.m. for which certification is requested that is attainable with the controls rigged in accordance with the approved rigging instructions and tolerances;

(b) Be able to maintain any required flight condition and make a smooth transition from any flight condition to any other flight condition without exceptional piloting skill, alertness, or strength, and without danger of exceeding the limit load factor under any operating condition probable for the type, including--

(1) Sudden failure of one engine, for multiengine rotorcraft meeting Transport Category A engine isolation requirements of Part 29 of this chapter; and

[(2) Sudden, complete power failure, for other rotorcraft;

(3) Sudden, complete control system failures specified in Sec. 27.695 of this Part; and

(c) Have any additional characteristic required for night or instrument operation, if certification for those kinds of operation is requested. Requirements for helicopter instrument flight are contained in Appendix B of this Part.]

Amdt. 27-19, Eff. 3/2/83

► Comments

▼ Document History

Notice of Proposed Rulemaking Actions:

Notice of Proposed Rulemaking. Notice No. [80-25](#); Issued on 12/15/80.

Final Rule Actions:

Final Rule. Docket No. [21180](#); Issued on 01/06/83.

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

APPLICANT: AERO Design Ltd.
1045 McTavish Rd. N.E.
Calgary, Alberta, T2E 7G9

DATE: 12 March, 2002
REV. No. 2 19 June, 2002

CORRESPONDANCE TO:
(If other than applicant)

MAKE: Bell Helicopter
MODEL: 206B, 206L, 206L-1, 206L-3, 206L-4

REGISTRATION: All Applicable
SERIAL No.: All Applicable

NATURE OF WORK: Installation of External Attachment Provisions

MODEL CERTIFICATION BASIS: FAR 27, Amendment 27-24, with exceptions as noted below.
MODIFICATION CERTIFICATION BASIS: FAR 27, Amendment 27-24, with exceptions as noted below.

Airworthiness Requirement	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
Paragraph 107	Amdt.				
Subpart B – Flight					
27.29	30 24 ✓ Empty Weight and Corresponding C of G	Data specified on inst'n drawing		X	
Subpart C – Strength Requirements					
27.301	30 24 ✓ Loads	Compliance with 23.471, 23.473, 23.337 and 23.561		X	
27.303	30 24 ✓ Factor of Safety	Analysis		X	
27.305	30 24 ✓ Strength and Deformation	Analysis		X	
27.307	30 28 ✓ Proof of Structure	Analysis		X	a) Original load path unaffected, as shown by comparison of material strengths. b) Provision load path analyzed to establish design allowable loads.
27.337	30 28 ✓ Limit Maneuvering Load Factor	Analysis		X	Limit maneuvering load factor to be applied in analysis to demonstrate vertical capacity of external attachment

Airworthiness Requirement		Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
1	27.471 30	24 ✓ Ground Loads – General	Analysis to demonstrate equivalent strength to existing fitting	X		Landing gear loads on fitting to be assessed by comparison with ultimate strength of original Type Approved fitting.
2	27.473 30	24 ✓ Ground loading conditions and assumptions	Analysis to demonstrate equivalent strength to existing fitting	X		Landing gear loads on fitting to be assessed by comparison with ultimate strength of original Type Approved fitting.
Paragraph		Amdt.				
26	27.501 30	28 ✓ Ground Loading Conditions – Landing Gear with Skids	Analysis to demonstrate equivalent strength to existing fitting	X		Landing gear loads on fitting to be assessed by comparison with ultimate strength of original Type Approved fitting.
	27.561 30 (b)(3) 24	24 ✓ Emergency Landing Conditions	Analysis		X	Ultimate manoeuvring load factor exceeds downward emergency landing load factor.
26	27.571 30	28 ✓ Fatigue Evaluation of Flight Structure	Analysis	X		Provision fastener joint only.
Subpart D – Design and Construction						
1	27.601 30	24 ✓ Design	Drawings		X	Design is conventional.
16	27.603 30	24 ✓ Materials	Drawings		X	Materials used are specified in Mil-Hdbk-5H.
16	27.605 30	24 ✓ Fabrication Methods	Drawings		X	Design is conventional.
1	27.609 30	24 ✓ Protection of Structure	Drawings		X	
1	27.611 30	24 ✓ Inspection Provisions	Drawings		X	Design is easy to inspect.
26	27.613 30	28 ✓ Material Strength Properties and Design Values	Values used as per Mil-Hdbk-5H		X	
1	27.625 30	24 ✓ Fitting Factor	Analysis		X	
1	27.725 30	24 ✓ Limit Drop Test	N/A			Ref. TCDS Equivalent Safety Finding for L-4. ✓ Landing gear loads on fitting to be assessed by comparison with ultimate strength of original Type Approved fitting.
26	27.727 30	28 ✓ Reserve Energy Absorption Drop Test	N/A			Ref. TCDS Equivalent Safety Finding for L-4. ✓ Landing gear loads on fitting to be assessed by comparison with ultimate strength of original Type Approved fitting.
26	27.865 30	28 ✓ External Load Attaching Means	N/A			Provision only: Consideration required for approval of equipment attached to provision.

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

APPLICANT: AERO Design Ltd.
1045 McTavish Rd. N.E.
Calgary, Alberta, T2E 7G9

DATE: 12 March, 2002
REV. No. 3 4 June, 2002

CORRESPONDANCE TO:
(If other than applicant)

MAKE: Bell Helicopter
MODEL: 206B, 206L, 206L-1, 206L-3, 206L-4

REGISTRATION: All Applicable
SERIAL No.: All Applicable

NATURE OF WORK: Installation of Side-Mounted External Cargo Basket

MODEL CERTIFICATION BASIS: FAR 27, Amendment 27-24, with exceptions as noted below.
MODIFICATION CERTIFICATION BASIS: FAR 27, Amendment 27-24, with exceptions as noted below.

Airworthiness Requirement		Subject for Compliance or Documentary Proof		Form of Substantiation	DOT	DAR	Comments
Paragraph	Amdt.						
Subpart B – Flight							
14 27.27	30	24	Centre of Gravity Limits	N/A			No change from Type Approval.
27.29		24	✓ Empty Weight and Corresponding C of G	Data specified on inst'n drawing		X	
1 27.51	30	24	✓ Takeoff	Flight Test		X	
24 27.65	30	24	✓ Climb: All Engines Operating	Flight Test		X	Determine ROC at V _y .
24 27.71	30	24	✓ Gliding Performance	Flight Test		X	Determine ROD in autorotation.
14 27.75	30	24	✓ Landing	Flight Test		X	
* 27.141	21 30	20	Flight Characteristics – General	Flight Test	SAME BASICALLY	X	
+ 27.143	21 30	1	Controllability and Maneuverability	Flight Test		X	
21 27.151	30	24	✓ Flight controls	Flight Test		X	
21 27.161	30	24	✓ Trim	Flight Test		X	
0 27.171	30	24	✓ Stability – General	Flight Test		X	
27.173	1	1	✓ Longitudinal Stability	Flight Test		X	
27.175	1	1	✓ Demonstration of Longitudinal Stability	Flight Test		X	
0 27.251	30	24	✓ Vibration	Flight Test		X	

Airworthiness Requirement	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
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Paragraph Amdt.

Subpart C – Strength Requirements

27.301	30 24 ✓	Loads – Air Drag Loads	Analysis		X	
27.301	30 24 ✓	Loads – Inertia Loads	Compliance with 27.337 and 27.561		X	
27.303	30 24 ✓	Factor of Safety	Analysis		X	
27.305	30 24 ✓	Strength and Deformation	Analysis and Test iaw AC 43.13-1A		X	
27.307	30 28 ✓	Proof of Structure	Analysis and Test iaw AC 43.13-1A		X	
27.337(a)	28 ✓	Limit Maneuvering Load Factor – Positive (3.5g)	Analysis and Test iaw AC 43.13-1A		X	Critical load factor in downward direction.
27.547	30 24 ✓	Main Rotor Structure	Flight Test	X		Proposed V _{NE} limitation. Assymetric drag may impose bending load on mast.
27.561	30 24 ✓	Emergency Landing Conditions	Analysis and Test iaw AC 43.13-1A		X	
27.561(b)3(i)	24 ✓	Emergency Landing Conditions – Up (1.5g)	Analysis and Test iaw AC 43.13-1A		X	
27.561(b)3(ii)	24 ✓	Emergency Landing Conditions – Fwd (4.0g)	N/A			Forward deflection or failure of basket poses no threat to occupants.
27.561(b)3(iii)	24 ✓	Emergency Landing Conditions – Side (2.0g)	Analysis and Test iaw AC 43.13-1A		X	
27.561(b)3(iv)	24 ✓	Emergency Landing Conditions – Down 4.0g)	Compliance with 27.337		X	27.337 Maouvering Load is Critical.

Subpart D – Design and Construction

27.601	30 24 ✓	Design	Drawings		X	Design is conventional.
27.603	30 24 ✓	Materials	Drawings		X	Materials used are specified in Mil-Hdbk-5H.
27.605	30 24 ✓	Fabrication Methods	Drawings		X	Design is conventional.
27.609	30 24 ✓	Protection of Structure	Drawings		X	
27.611	30 24 ✓	Inspection Provisions	Drawings		X	Design is easy to inspect.
27.613	28 ✓	Material Strength Properties and Design Values	Values used as per Mil-Hdbk-5H		X	
27.625	30 24 ✓	Fitting Factor	Analysis		X	
27.783	30 28 ✓	Doors	N/A			Installation does not block doors.
27.787(a)	30 24 ✓	Cargo and Baggage Compartments	Compliance with 23.301 through 307		X	
27.787(b)	30 24 ✓	Cargo and Baggage Compartments	Design		X	Basket is a closed container.
27.787(c), (d)	30 24 ✓	Cargo and Baggage Compartments	N/A			Cargo is external to helicopter.

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

Airworthiness Requirement		Subject for Compliance or Documentary Proof		Form of Substantiation	DOT	DAR	Comments
Paragraph	Amdt.						
27.807	30 28 ✓	Emergency Exits		N/A		X	Installation does not block doors.
27.865(a)	30 28 ✓	External Load Attaching Means		Compliance with 27.337		X	Failure of an attachment does not endanger the rotorcraft.
27.865(b), (c)	30 28 ✓	External Load Attaching Means		N/A			
27.865(d)	30 28 ✓	External Load Attaching Means		N/A			
27.1387	30 24 ✓	Position Light System Dihedral Angles		N/A	X		No change from Type Approval.
27.1401	30 24 ✓	Anticollision Light System		Statement			Light located at FS 396, WL 130 on vertical fin. Basket has no significant effect on visibility of anticollision light.
Subpart G – Operating Limitations and Information							
27.1505	30 24 ✓	Never Exceed Speed		Flight Test, Flight Manual Supplement (if req'd)	X		0.9 V _d that can be achieved in flight test with basket installed, if less than basic V _{ne} .
27.1525	30 24 ✓	Kinds of Operation		Flight Manual Supplement	X		Limited to VFR only.
27.1529	30 24 ✓	Instructions for Continuing Airworthiness		Maintenance Manual Supplement	X		
27.1557(a)	30 24 ✓	Miscellaneous Markings and Placards – Baggage Compartments		Placard		X	
27.1557(b)	30 24 ✓	Miscellaneous Markings and Placards		N/A			
27.1557(c)	30 24 ✓	Miscellaneous Markings and Placards		N/A			
27.1557(d)	30 24 ✓	Miscellaneous Markings and Placards		N/A			
27.1581	30 24 ✓	Rotorcraft Flight Manual – General		Flight Manual Supplement	X		
27.1583(c)	30 24 ✓	Operating Limitations – Weight and Loading Information		Flight Manual Supplement	X		
27.1585	30 1 ✓	Operating Procedures (a)+(b)		Flight Manual Supplement	X		Effect (if any) of basket installation on performance.
27.1587	30 1 ✓	Performance Information		Flight Test, Flight Manual Supplement (if req'd)	X		
27.1589	30 24 ✓	Loading Information		Flight Manual Supplement & Placard	X		Placard installed on basket lid and beams.
Airworthiness Manual Requirements							
527.1581(e)	✓	Rotorcraft Flight Manual – Units		SI and Imperial Units provided in Flight Manual Supplement	X		

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

APPLICANT: AERO Design Ltd.
2013 39th Avenue NE
Calgary, Alberta, T2E 6R7

DATE: 29 March, 2004
REV. No. 0

CORRESPONDANCE TO:
(If other than applicant)

MAKE: Bell Helicopter
MODEL: 407

REGISTRATION: All Applicable
SERIAL No.: All Applicable

NATURE OF WORK: Installation of Side-Mounted External Cargo Basket

MODEL CERTIFICATION BASIS: FAR 27, Amendment 27-30, with exceptions as noted below.
MODIFICATION CERTIFICATION BASIS: FAR 27, Amendment 27-30, with exceptions as noted below.

Airworthiness Requirement		Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
Paragraph	Amdt.					
Subpart B – Flight						
27.27	30	Centre of Gravity Limits	N/A			No change from Type Approval.
27.29	30	Empty Weight and Corresponding C of G	Data specified on inst'n drawing		X	
27.51	30	Takeoff	Flight Test	X		Flight tests performed using the same basket on Bell 206 and similar basket on Bell 407 to satisfy the flight test requirements. Limitations established in previous flight tests to be used with this installation.
27.65	30	Climb: All Engines Operating	Flight Test	X		
27.71	30	Gliding Performance	Flight Test	X		
27.75	30	Landing	Flight Test	X		
27.141	30	Flight Characteristics – General	Flight Test	X		
27.143	30	Controllability and Maneuverability	Flight Test	X		
27.151	30	Flight controls	Flight Test	X		
27.161	30	Trim	Flight Test	X		
27.171	30	Stability – General	Flight Test	X		
27.173	1	Longitudinal Stability	Flight Test	X		
27.175	1	Demonstration of Longitudinal Stability	Flight Test	X		
27.251	30	Vibration	Flight Test	X		
Subpart C – Strength Requirements						
27.301	30	Loads – Air Drag Loads	Analysis		X	
27.301	30	Loads – Inertia Loads	Compliance with 27.337 and 27.561		X	

Airworthiness Requirement	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
Paragraph	Amdt.				
27.303	30	Factor of Safety		X	
27.305	30	Strength and Deformation		X	
27.307	30	Proof of Structure		X	
27.337(a)	30	Limit Maneuvering Load Factor – Positive		X	Critical load factor in downward direction.
27.471	30	Ground Loads - General	X		Landing gear loads on fitting to be assessed by comparison with ultimate strength of original Type Approved fitting, and test as required.
27.473	30	Ground Loading Conditions and Assumptions	X		Landing gear loads on fitting to be assessed by comparison with ultimate strength of original Type Approved fitting, and test as required.
27.501	30	Ground Loading Conditions – Landing Gear with Skids			Landing gear loads on fitting to be assessed by comparison with ultimate strength of original Type Approved fitting, and test as required.
27.547	30	Main Rotor Structure	X		See comments for flight test above
27.561	30	Emergency Landing Conditions		X	
27.561(b)3(i)	24	Emergency Landing Conditions – Up		X	
27.561(b)3(ii)	24	Emergency Landing Conditions – Fwd			Forward deflection or failure of basket poses no threat to occupants.
27.561(b)3(iii)	24	Emergency Landing Conditions – Side		X	
27.561(b)3(iv)	24	Emergency Landing Conditions – Down		X	27.337 Maneuvering Load is Critical.
27.571	30	Fatigue Evaluation of Flight Structure		X	Provision fastener joint only

Subpart D – Design and Construction

27.601	30	Design	Drawings	X	Design is conventional.
27.603	30	Materials	Drawings	X	Materials used are specified in Mil-Hdbk-5H.
27.605	30	Fabrication Methods	Drawings	X	Design is conventional.
27.609	30	Protection of Structure	Drawings	X	
27.611	30	Inspection Provisions	Drawings	X	Design is easy to inspect.
27.613	30	Material Strength Properties and Design Values	Values used as per Mil-Hdbk-5H	X	
27.625	30	Fitting Factor	Analysis	X	
27.725	30	Limit Drop Test	N/A		Ref. TCDS Equivalent Safety Finding. Landing gear loads on fitting to be assessed by comparison with ultimate strength of original Type Approved fitting, and test as required.
27.727	30	Reserve Energy Absorption Drop Test	N/A		Installation does not block doors.
27.783	30	Doors	N/A		
27.787(a)	30	Cargo and Baggage Compartments	Compliance with 23.301 through 307	X	
27.787(b)	30	Cargo and Baggage Compartments	Design	X	Basket is a closed container.
27.787(c), (d)	30	Cargo and Baggage Compartments	N/A		Cargo is external to helicopter.

Airworthiness Requirement	Subject for Compliance or Documentary Proof		Form of Substantiation	DOT	DAR	Comments
Paragraph	Amdt.					
27.807	30	Emergency Exits	N/A		X	Installation does not block doors.
27.865(a)	30	External Load Attaching Means	Compliance with 27.337		X	
27.865(b), (c)	30	External Load Attaching Means	N/A			
27.865(d)	30	External Load Attaching Means	N/A			Failure of an attachment does not endanger the rotorcraft.
27.1387	30	Position Light System Dihedral Angles	N/A			No change from Type Approval.
27.1401	30	Anticollision Light System	Statement	X		Light located at FS 396, WL 130 on vertical fin. Basket has no significant effect on visibility of anticollision light.
Subpart G – Operating Limitations and Information						
27.1505	30	Never Exceed Speed	Flight Test, Flight Manual Supplement	X		Vne limits as specified in the existing Flight Manual (140 kts.)
27.1525	30	Kinds of Operation	Flight Manual Supplement	X		Limited to VFR only.
27.1529	30	Instructions for Continuing Airworthiness	Maintenance Instructions	X		Uses existing approved maintenance instructions
27.1557(a)	30	Miscellaneous Markings and Placards – Baggage Compartments	Placard		X	
27.1557(b)	30	Miscellaneous Markings and Placards	N/A			
27.1557(c)	30	Miscellaneous Markings and Placards	N/A			
27.1557(d)	30	Miscellaneous Markings and Placards	N/A			
27.1581	30	Rotorcraft Flight Manual – General	Flight Manual Supplement	X		
27.1583(c)	30	Operating Limitations – Weight and Loading Information	Flight Manual Supplement	X		
27.1585	30	Operating Procedures	Flight Manual Supplement	X		
27.1587	30	Performance Information	Flight Manual Supplement	X		
27.1589	30	Loading Information	Flight Manual Supplement & Placard	X		Placard installed on basket lid
Airworthiness Manual Requirements						
527.1581(e)		Rotorcraft Flight Manual – Units	SI and Imperial Units provided in Flight Manual Supplement	X		

DRAG LOAD ON BASKET

$l_{\text{basket}} := 74 \cdot \text{in}$ Length of basket.

$w_{\text{basket}} := 22 \cdot \text{in}$ Width of basket.

$h_{\text{basket}} := 16 \cdot \text{in}$ Height of basket.

$A_f := w_{\text{basket}} \cdot h_{\text{basket}}$

$A_f = 0.227 \cdot \text{m}^2$ Frontal Area of basket.

$A_p := l_{\text{basket}} \cdot w_{\text{basket}}$

$A_p = 1.050 \cdot \text{m}^2$ Planar Area of basket.

$\frac{l_{\text{basket}}}{w_{\text{basket}}} = 3.4$ Fineness ratio of basket

$C_{Do} := 1.6$ Drag Coefficient of Basket, (overestimated)
(Ref. Hoerner, Fluid Dynamic Drag, Figure 22).

$\rho := 0.002378 \cdot \frac{\text{slug}}{\text{ft}^3}$ Density of air at Sea Level.

$V_{ne} := 140 \cdot \text{knots}$ Never-Exceed-Speed of Bell 407.
(Ref. Bell 407 Flight Manual.)

$V_d := \frac{V_{ne}}{0.9}$
 $V_d = 156 \cdot \text{knots}$ Design Dive Speed of Bell 407

$\text{Drag} := \frac{\rho}{2} \cdot V_d^2 \cdot A_f \cdot C_{Do}$

$\text{Drag} = 321 \cdot \text{lbf}$ Drag on basket.

$P_{\text{drag_ult}} := \text{Drag} \cdot n_{sf} \cdot n_{ff}$

$P_{\text{drag_ult}} = 553 \cdot \text{lbf}$ Ultimate applied Drag load on basket.

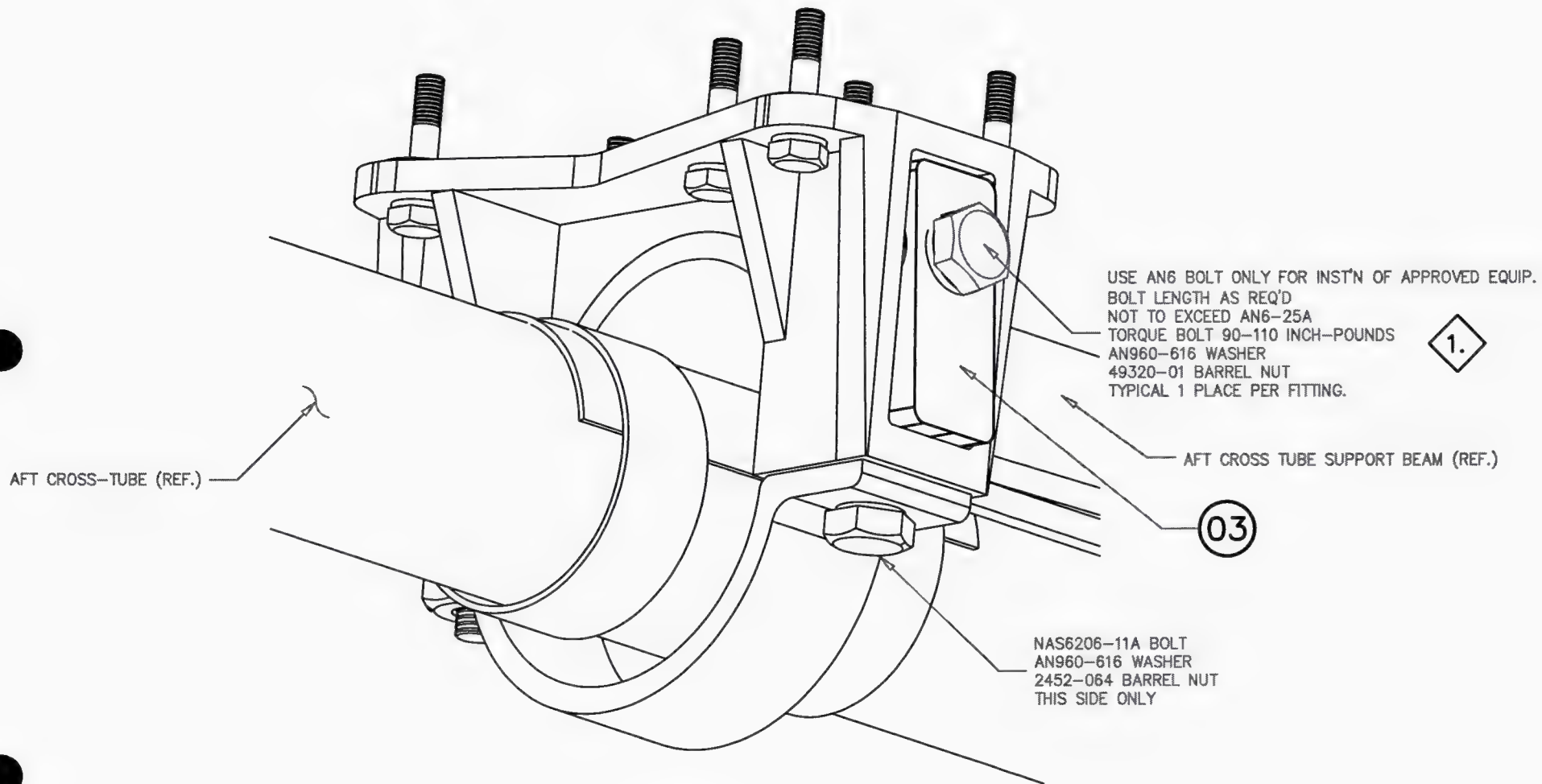
$P_{\text{drag_test}} := \text{Drag} \cdot n_{sf}$

$P_{\text{drag_test}} = 481 \cdot \text{lbf}$ Ultimate Drag load on basket in Static Test.

$AC_{\text{drag}} := 38.5 \cdot \text{in}$ Lateral Aerodynamic Center of basket.

$P_{\text{drag_test_beam}} := \frac{\text{Drag} \cdot n_{sf}}{2}$

$P_{\text{drag_test_beam}} = 240 \cdot \text{lbf}$ Ultimate Drag load on beam in Static Test.



VIEW B AFT FITTING

AN6 BOLT ORIENTED FORWARD
TYPICAL LEFT AND RIGHT

CERT BASIS

206 L-4

FAR 27 @ AMDT 27-24

407

FAR 27 @ AMDT 27-30

27.561(b)(3) @ 27-24

27.563 @ 27-25

27.785 @ 27-24

27.1093 @ 27-8

27.173 @ 27-1

27.175 @ 27-1

DELETE 360, 1195, 950(b) 1

V_{NE}
126.5 kts.

130 kts (w/ Pedal stops)

140 kts

BASKET LOADS

$$W_{\text{basket}} := 55 \cdot \text{lbf}$$

Weight of basket

$$W_{\text{cargo}} := 200 \cdot \text{lbf}$$

Weight of cargo

$$W_{\text{beam}} := 10 \cdot \text{lbf}$$

Weight of beams (each)

$$W_{\text{total}} := (W_{\text{basket}} + W_{\text{cargo}} + 2 \cdot W_{\text{beam}})$$

$$W_{\text{total}} = 275 \cdot \text{lbf}$$

Total weight of basket installation

The aft beam is critical as the spacing on the helicopter attachments are closer on the aft beam than on the front beam.

Assuming 2/3 of cargo is at the aft end:

$$p_{\text{ext}} := \frac{W_{\text{basket}}}{2} + \frac{2}{3} \cdot W_{\text{cargo}} + W_{\text{beam}}$$

$$p_{\text{ext}} = 171 \cdot \text{lbf}$$

Load on one end of basket

$$P_{\text{ult}} := p_{\text{ext}} \cdot n_{\text{man_ult}}$$

$$P_{\text{ult}} = 897 \cdot \text{lbf}$$

Ultimate load due to basket installation on aft beam

Assuming all of cargo is at the aft end:

$$p_{\text{ext}} := \frac{W_{\text{basket}}}{2} + W_{\text{cargo}} + W_{\text{beam}}$$

$$p_{\text{ext}} = 238 \cdot \text{lbf}$$

Load on one end of basket

$$P_{\text{ult}} := p_{\text{ext}} \cdot n_{\text{man_ult}}$$

$$P_{\text{ult}} = 1247 \cdot \text{lbf}$$

Ultimate load due to basket installation on aft beam

600 limit ✓
825 limit. ✓

MS FOR ALL LOAD AT END

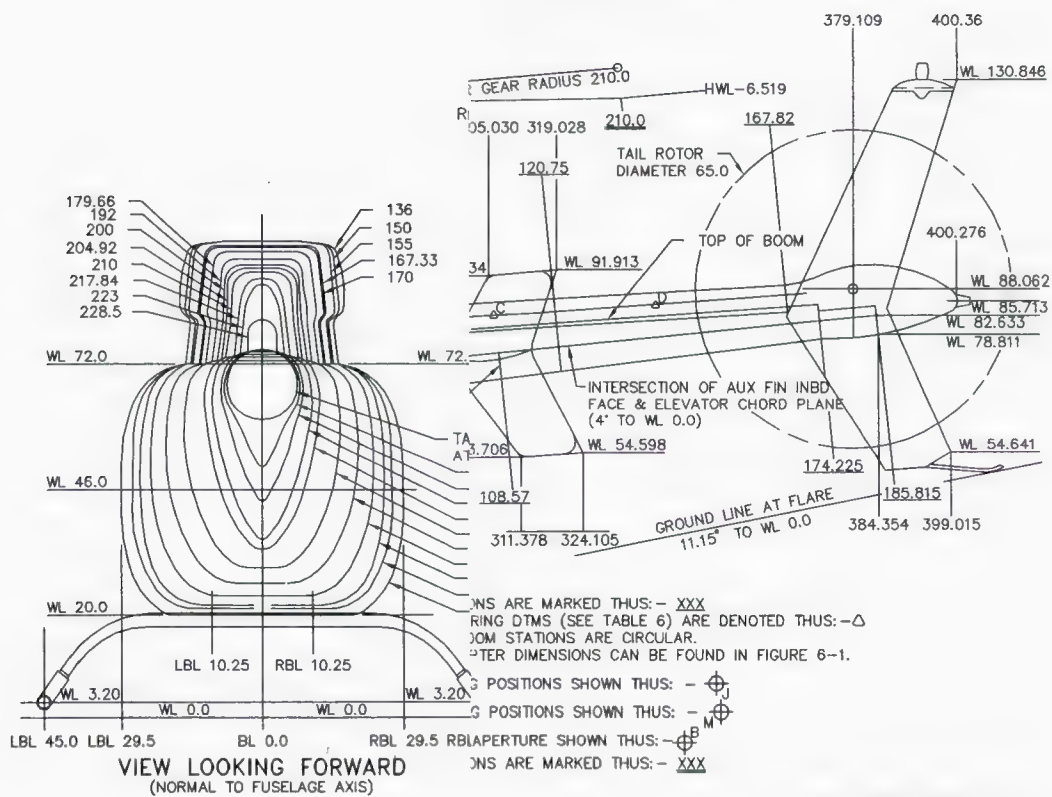
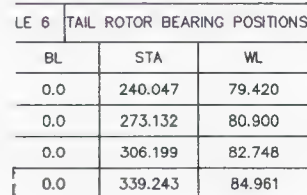
$$@ B \quad MS = 0.09$$

$$@ C \quad MS = 0.004$$

For 2/3

$$@ B \quad MS = 0.90$$

$$@ C \quad MS = 0.261$$



407MM_06000_00020_001_C00

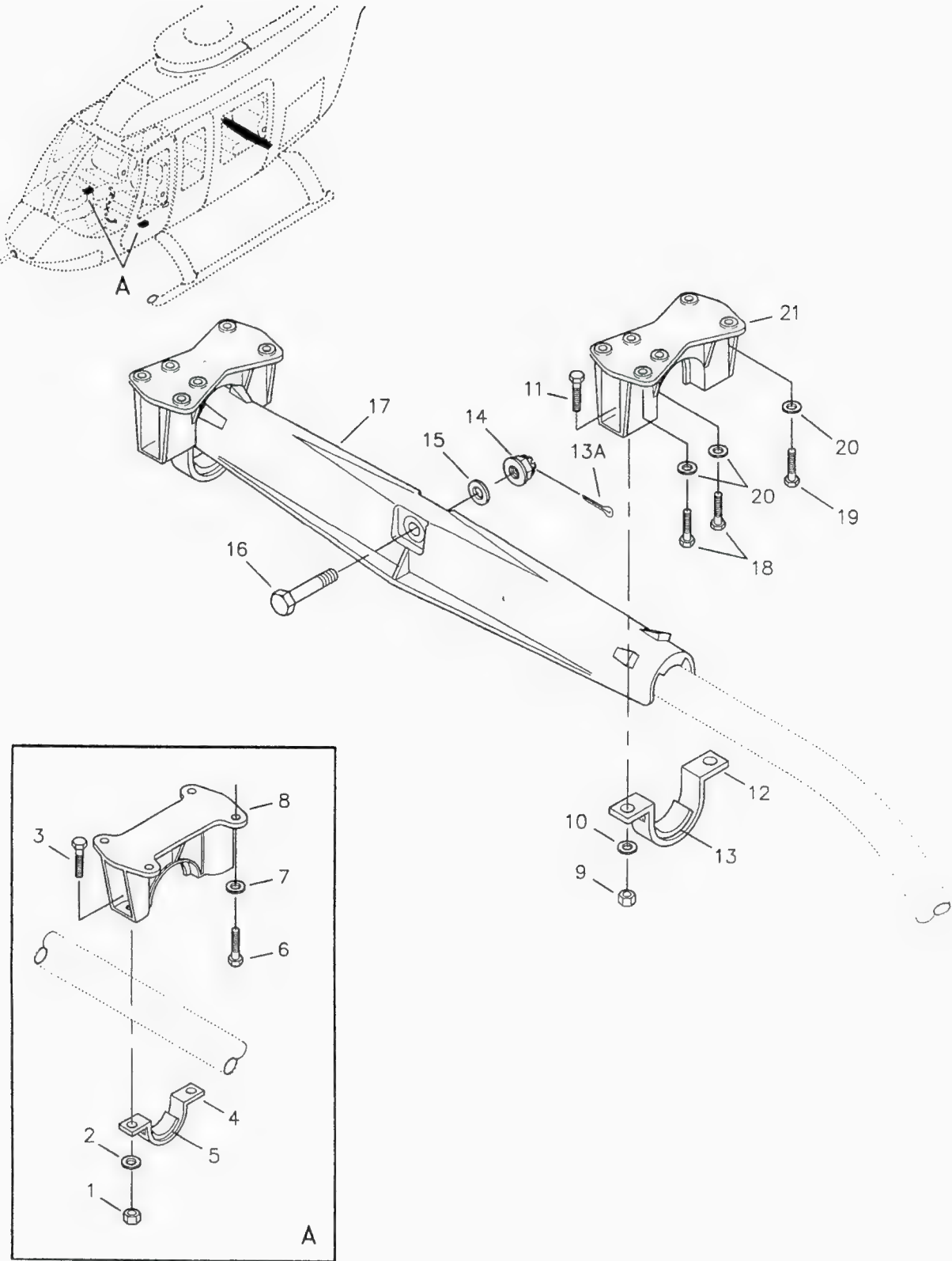


Figure 32-4. Beam assembly, support, aft crosstube and support installation, landing gear

(1) INDEX NUMBER	(2) PART NUMBER	(3) ITEM NAME	(4) UNIT PER ASSY	(5) A V A I L	(6) U O C
		FIGURE: 32-4. Beam assembly, support, aft crosstube and support installation, landing gear			
	407-030-001-101	FUSELAGE ASSY, FWD	REF		
1	MS21042L5	.NUT	4		
2	NAS1149F0563P	.WASHER	4		
3	NAS6205-11	.BOLT (NOTE 1)	4		
		(ALTERNATE PART)			
3	NAS6205-12	.BOLT (NOTE 1)	4		
4	206-052-105-035	.STRAP ASSY, LANDING GEAR, CROSSTUBE	2		
5	206-052-105-027	.CUSHION, LANDING GEAR, CROSSTUBE	1		
6	NAS6604-7	.BOLT	8		
7	140-007-16A17B4	.WASHER	8		
8	407-030-111-101	.FITTING, FUSELAGE, FWD, LANDING GEAR	2		
9	MS21042L6	.NUT	4		
10	NAS1149F0663P	.WASHER	4		
11	NAS6206-10	.BOLT	4		
12	400-052-015-101	.SUPPORT ASSY, OUTBD, LOWER, AFT LANDING GEAR	2		
13	400-052-015-105	.CUSHION, OUTBD, LOWER, AFT LANDING GEAR	1		
13A	MS24665-285	.PIN, COTTER	1		
14	MS14145L6	.NUT	1		
15	140-009D25T48	.WASHER	1		
16	400-052-009-101	.BOLT	1		
17	400-052-007-109	.BEAM ASSY, SUPPORT, AFT CROSSTUBE, LANDING GEAR	1		
	407-030-520-101	.SUPPORT INSTL, LANDING GEAR, AFT	1		
18	NAS6604-15	.BOLT	8		
19	NAS6604-13	.BOLT	4		
20	NAS1149F0463J	.WASHER	12		
21	407-030-112-101	.FITTING, FUSELAGE, AFT LANDING GEAR	2		
		NOTE 1 NAS6205-12 CAN BE USED INSTEAD OF AN NAS6205-11			
		- IF AN NAS1149F0563P WASHER IS INSTALLED UNDER THE			
		BOLT HEAD			

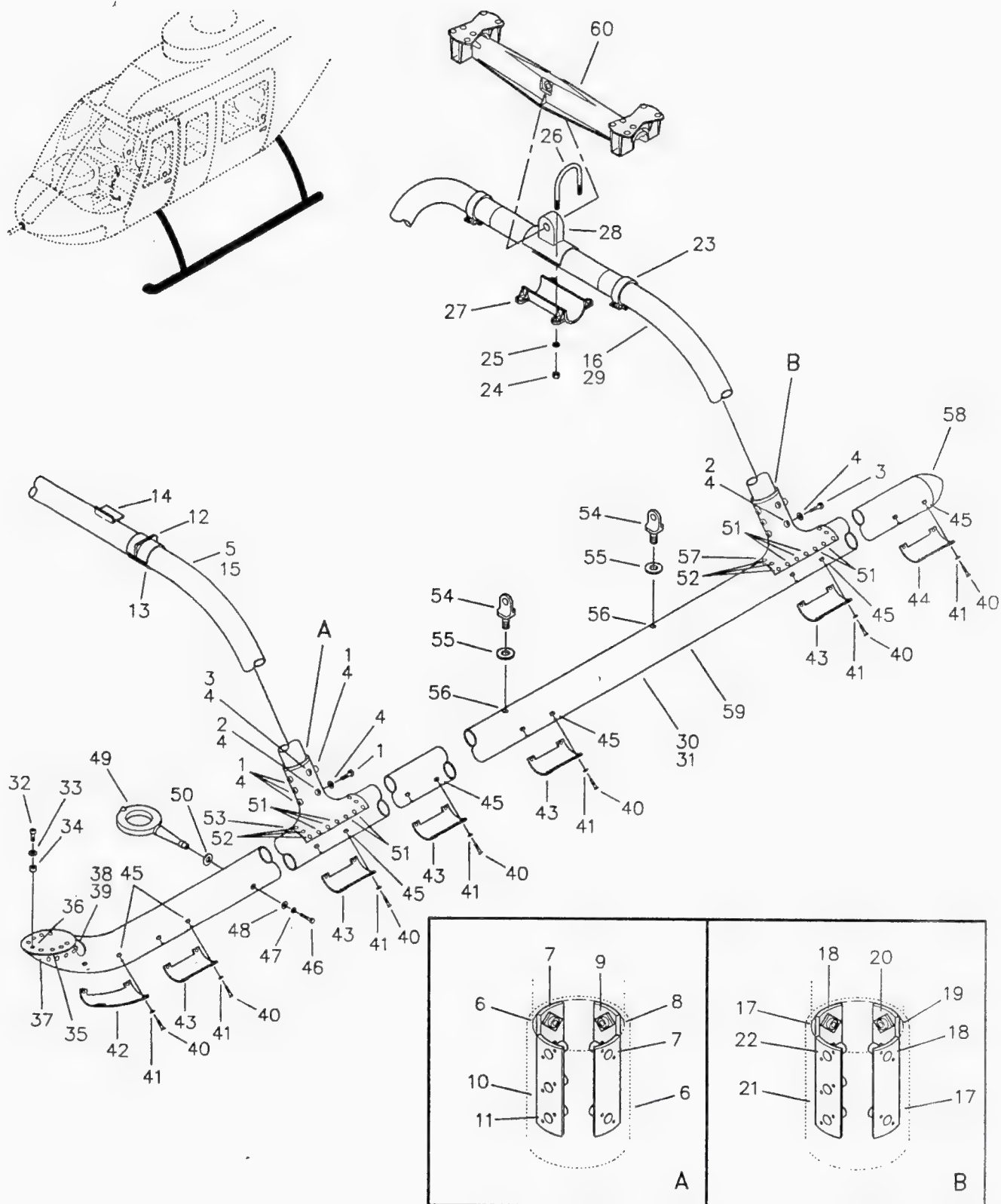
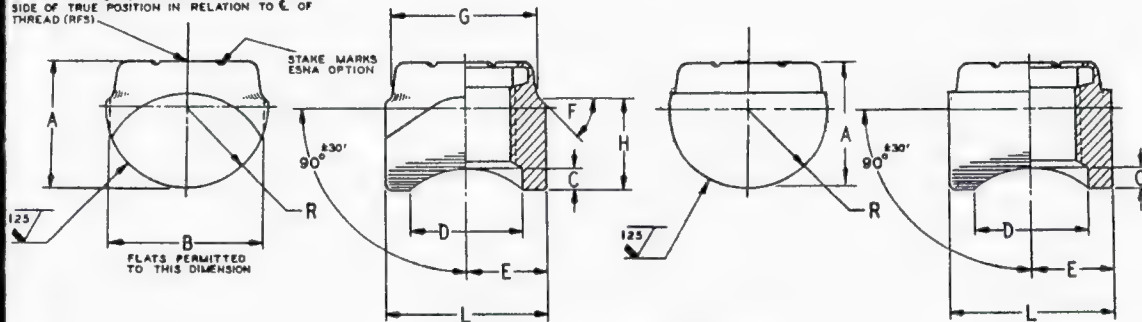


Figure 32-3. Skid gear kit, high

(1) INDEX NUMBER	(2) PART NUMBER	(3) ITEM NAME	(4) UNIT PER ASSY	(5) A V A I L	(6) U O C
		FIGURE: 32-3. Skid gear kit, high			
	407-706-007-101	SKID GEAR KIT, HIGH	1		
	407-050-002-101	..LANDING GEAR ASSY, HIGH	1		
1	MS27039-5-18	..SCREW	10		
2	MS27039-5-17	..SCREW	4		
3	MS27039-5-16	..SCREW	22		
4	NAS1149G0532P	..WASHER	36		
5	407-050-201-101	..CROSS TUBE ASSY, FWD	1		
6	407-050-113-105	..PLATE ASSY	4		
7	MS21075L5	....NUTPLATE	2		
8	407-050-113-101	..PLATE ASSY	2		
9	MS21075L5	....NUTPLATE	2		
10	407-050-113-103	..PLATE ASSY	2		
11	MS21075L5	....NUTPLATE	3		
12	206-053-200-101	..STRAP ASSY	2		
13	206-050-301-101	..ABRASION STRIP	2		
14	206-050-303-101	..CLIP	2		
15	407-050-201-115	..CROSS TUBE, FWD	1		
16	407-050-202-101	..CROSS TUBE ASSY, AFT	1		
17	407-050-113-111	..PLATE ASSY	4		
18	MS21075L5	....NUTPLATE	2		
19	407-050-113-107	..PLATE ASSY	2		
20	MS21075L5	....NUTPLATE	2		
21	407-050-113-109	..PLATE ASSY	2		
22	MS21075L5	....NUTPLATE	3		
23	NE102868-0245	..CLAMP, T-BOLT	2		
24	MS21042L4	..NUT	4		
25	NAS1149G0416P	..WASHER	4		
26	205-050-134-001	..U-BOLT	2		
27	205-050-133-101	..SUPPORT	1		
28	400-052-006-101	..SUPPORT	1		
29	407-050-202-115	..CROSS TUBE, AFT	1		
30	206-053-118-109	..SKID TUBE ASSY, LH	1		
31	206-053-118-110	..SKID TUBE ASSY, RH	1		
	206-050-236-101	..TOW RING INSTL	1		
32	MS27039-4-11	..SCREW	1		
33	AN960PD416L	..WASHER	1		
34	NAS43DD4-10	..SPACER	1		
35	206-050-236-011	..COVER	1		
36	MS21071L4	..NUTPLATE	1		
37	206-050-236-013	..STIFFENER	1		
38	206-050-236-018	..CLIP	1		
39	206-053-236-017	..CLIP	1		
40	MS27039-1-09	..SCREW	28		
41	AN960-10L	..WASHER	28		
42	206-050-129-005	..SHOE ASSY	1		
43	206-050-128-001	..SHOE ASSY	5		
44	206-050-128-101	..SHOE ASSY	1		
45	BN360-1032-2	..NUT ASSY	28		
	206-052-104-001	..FITTING INSTL, TOW	1		
46	NAS1190C4P6	..SCREW	1		
47	AN960C416	..WASHER	1		
48	AN960JD616	..WASHER	1		
49	206-052-104-003	..FITTING	1		
50	AN960JD1016	..WASHER	1		
51	MS90354-0805	..RIVET	20		
52	MS90354-1005	..RIVET	20		
53	206-053-194-101	..SADDLE, FWD	1		
54	206-050-142-001	..EYE BOLT	2		
55	204-050-139-003	..WASHER	2		
56	206-053-121-001	..INSERT ASSY	2		



℄ OF BARREL (RFS) LOCATED WITHIN .005 EITHER
SIDE OF TRUE POSITION IN RELATION TO ℄ OF
THREAD (RFS)

**PROFILE — ESNA OPTION**

ESNA PART NUMBER	THREAD	A MAX	B MIN	C ±.015	D ±.015	E ±.005	F REF	G REF	H REF	L ±.015	R +0.000 -0.015	ULTIMATE TENSILE STRENGTH LB MIN (SEE PERFORMANCE NOTE)	APPROX WEIGHT LB/100	ESNA RETAINER PART NUMBER (SEE PAGE 2 OF 2)
2452-02	.1900-32UNJF-3B	.374	.396	.055	.250	.203	48°	.389	.265	.406	.2150	4,070	.89	2452-02RET
2452-048	.2500-28UNJF-3B	.422	.474	.055	.313	.242	49°	.461	.298	.484	.2455	7,260	1.30	2452-048RET
2452-054	.3125-24UNJF-3B	.451	.536	.071	.375	.273	51°	.525	.320	.546	.2765	11,500	1.70	2452-054RET
2452-064	.3750-24UNJF-3B	.556	.646	.088	.438	.328	50°	.591	.418	.656	.3315	17,100	2.90	2452-064RET
2452-070	.4375-20UNJF-3B	.633	.740	.094	.500	.375	45°	.669	.457	.750	.3780	23,175	4.20	2452-070RET
2452-080	.5000-20UNJF-3B	.715	.849	.109	.563	.429	45°	.805	.501	.859	.4330	30,825	6.40	2452-080RET
2452-098	.5625-18UNJF-3B	.731	.912	.119	.625	.461	45°	.909	.516	.922	.4640	39,150	7.60	2452-098RET
2452-108	.6250-18UNJF-3B	.842	1.022	.137	.688	.516	45°	.939	.616	1.032	.5190	49,050	10.00	2452-108RET
2452-126	.7500-16UNJF-3B	.983	1.209	.160	.813	.609	45°	1.111	.740	1.219	.6205	71,100	17.00	2452-126RET
2452-144	.8750-14UNJF-3B	1.060	1.334	.184	.938	.750	45°	1.295	.830	1.500	.6830	96,860	26.00	2452-144RET
2452-162	1.0000-12UNJF-3B	1.194	1.537	.216	1.063	.875	45°	1.497	.888	1.750	.7770	126,500	36.00	2452-162RET
2452-164	1.0000-14UNJS-3B	1.194	1.537	.220	1.063	.875	45°	1.217	1.021	1.750	.7770	128,250	45.00	2452-162RET
2452-182	1.1250-12UNJF-3B	1.489	1.818	.250	1.187	.914	50°	1.655	1.212	1.828	.9330	162,000	66.00	2452-182RET
2452-202	1.2500-12UNJF-3B	1.684	2.053	.240	1.313	1.125	45°	1.841	1.358	2.250	1.0580	202,500	100.00	2452-202RET
2452-222	1.3750-12UNJF-3B	1.810	2.334	.248	1.438	1.172	43°	2.058	1.491	2.344	1.1830	246,375	135.00	2452-222RET
2452-242	1.5000-12UNJF-3B	1.943	2.646	.256	1.563	1.375	46°	2.250	1.616	2.750	1.3395	295,875	185.00	2452-242RET

MATERIAL:

STEEL - AISI C-1137 OR EQUIV. SIZE -02 ONLY.
STEEL - AISI 4130, 4340 OR EQUIV. ALL OTHER SIZES.

FINISH:

CADMIUM PLATE - QQ-P-416, TYPE 1, CLASS 2 (SEE CODE)

LOCKING INSERT: RED NYLON (250°F MAX PERFORMANCE).

HARDNESS: ROCKWELL "B" 94-103 (SIZE -02 ONLY)
ROCKWELL "C" 29-35 (SIZE -108 & -144)
ROCKWELL "C" 31-37 (SIZE -054, -126 & -162, -164)
ROCKWELL "C" 26-32 (ALL OTHER SIZES)

MAGNETIC PARTICLE INSPECTION: PARTS ARE INDIVIDUALLY INSPECTED IN ACCORDANCE WITH MILITARY SPECIFICATION MIL-I-6868.

THREADS: MIL-S-8879.

SURFACE FINISH: MIL-STD-10.

PERFORMANCE:

TORQUE - MIL-N-25027

YIELD STRENGTH - AT 2/3 OF THE ULTIMATE TENSILE STRENGTH OF THE NUT THERE WILL BE NO PERMANENT DISTORTION OR YIELDING OF THE NUT WHICH WILL AFFECT FUNCTIONING, USE, OR REUSE OF THE NUT.

AXIAL TENSILE STRENGTH - EQUIVALENT TO 180,000 PSI AT THE BASIC PITCH DIAMETER AND WILL BE OBTAINED WHEN TENSILE TESTED WITH A BOLT HAVING A MINIMUM TENSILE STRENGTH OF 200,000 PSI AND INSTALLED IN A 7075-T6 ALUMINUM ALLOY FITTING HAVING AN INSTALLATION HOLE DIAMETER APPROXIMATELY .009 LARGER THAN THE CORRESPONDING BARREL NUT DIAMETER MAXIMUM.

THESE ULTIMATE STRENGTH VALUES ARE EQUAL TO, OR IN EXCESS OF, THE TENSILE STRENGTH OF NAS624-644 SERIES BOLTS.

PART CODING:**F 2452-048**

THREAD SIZE
NUT TYPE

FOR POST PLATE TREATMENT (PER QQ-P-416, TYPE II) PREFIX COMPLETE PART NUMBER WITH LETTER "F".

PJ-1596-24

REFERENCE STANDARDS:

**NUT-BARREL, HIGH TENSILE,
LIGHTWEIGHT & RETAINER, 250°F**

**2452
2452RET**
PAGE 1 OF 2

FWD BRACKET

$$\begin{array}{r} 2.214 \\ 2.706 \\ \hline 4.920 \end{array}$$

$$2.46 \rightarrow \begin{array}{c} 0 \\ \downarrow \\ 0 \end{array}$$

$$\begin{array}{r} 5.158 \\ 4.661 \\ \hline 9.819 \end{array}$$

$$\begin{array}{r} 2 \overline{) 9.819} \\ 4 \\ \hline 19 \end{array}$$

SKID TUBE 2.216

2402 w/ PAD

$$\begin{array}{r} 0.508 + 0.483 \\ 0.483 \\ \hline .991 \end{array}$$

1.290

$$\begin{array}{r} 1.290 \\ - 0.991 \\ \hline .299 \end{array}$$

WEB THICKNESS

5/116

HOLE FOR SADDLE ON FRONT



SKID TUBE

206B

206L

2.276

2.267

407 AM FTG

1/4 BOLTS TO HELICOPTER

2.690
25
2.44

4.815
.250
4.865



3.328 HIGH
3.293
3.304

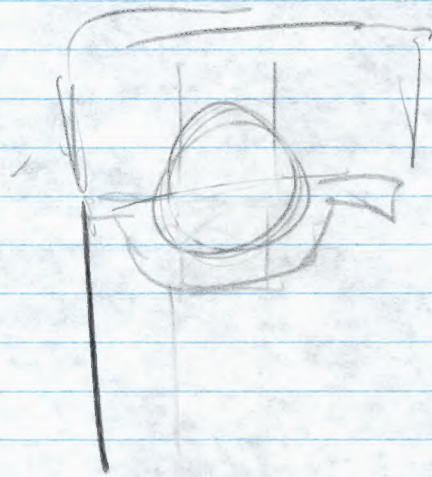
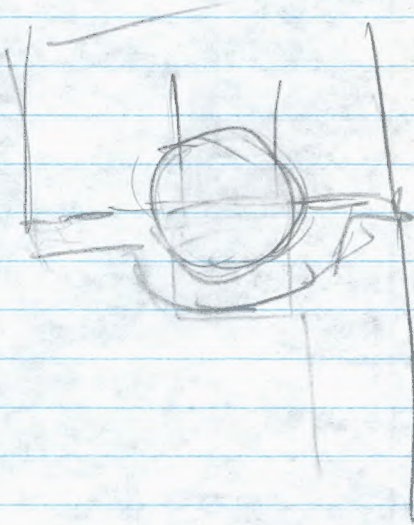
SADDLE BOLTS
3/8



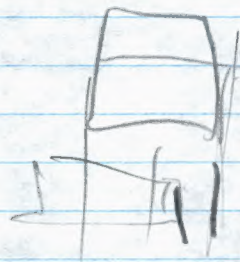
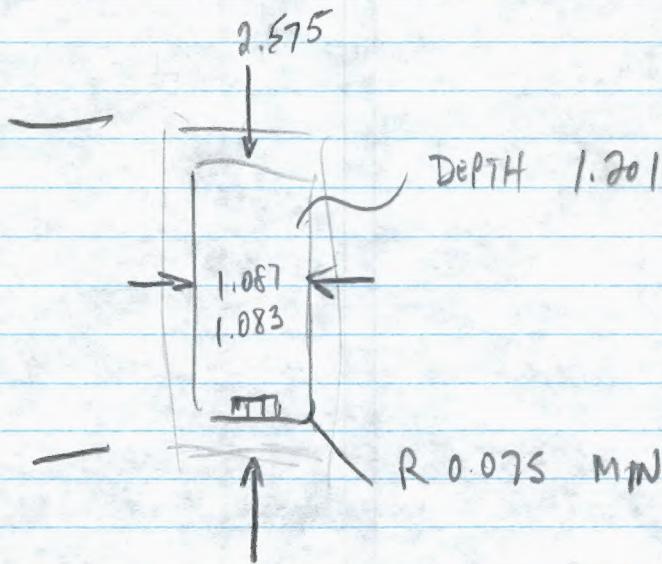
DIA OF BEAM

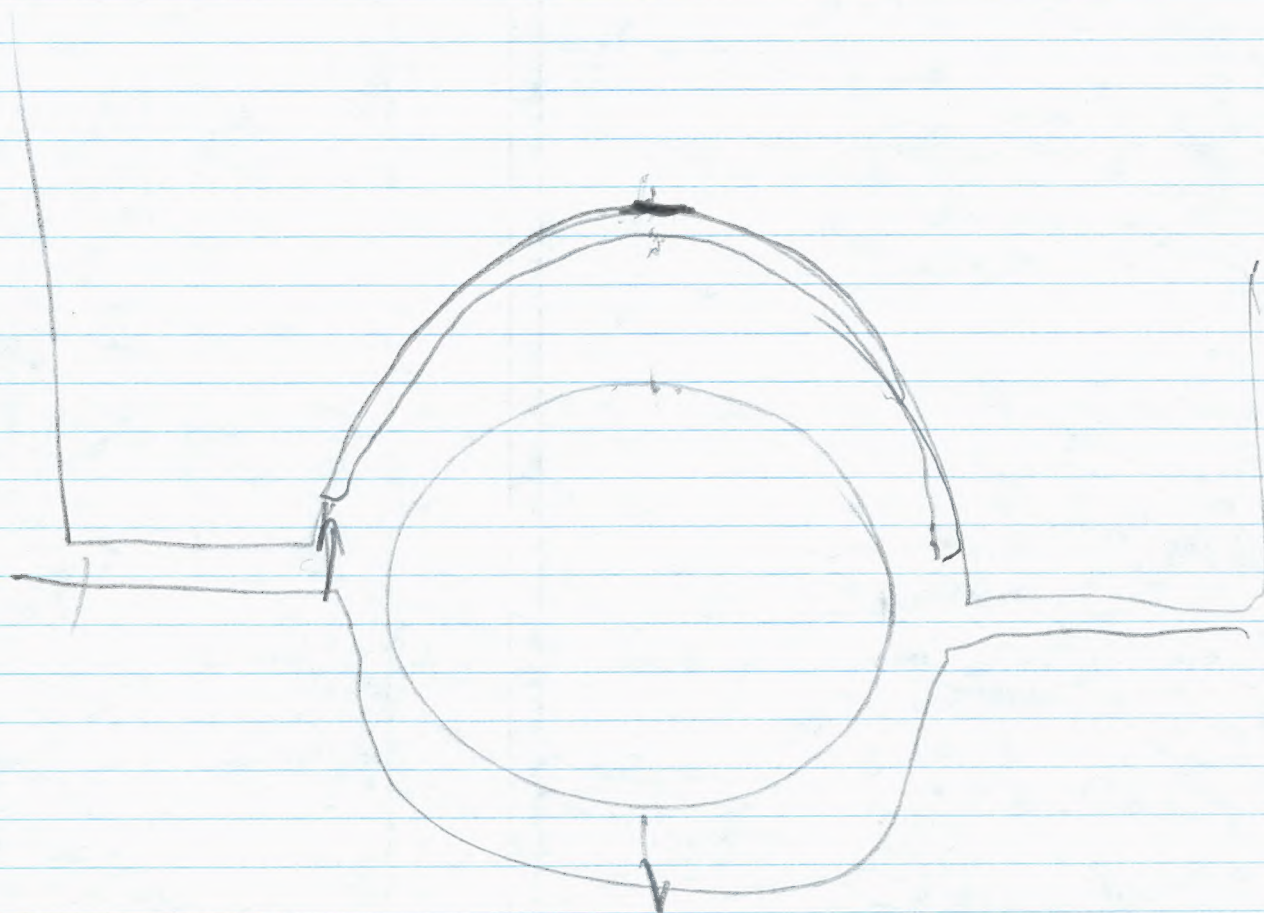
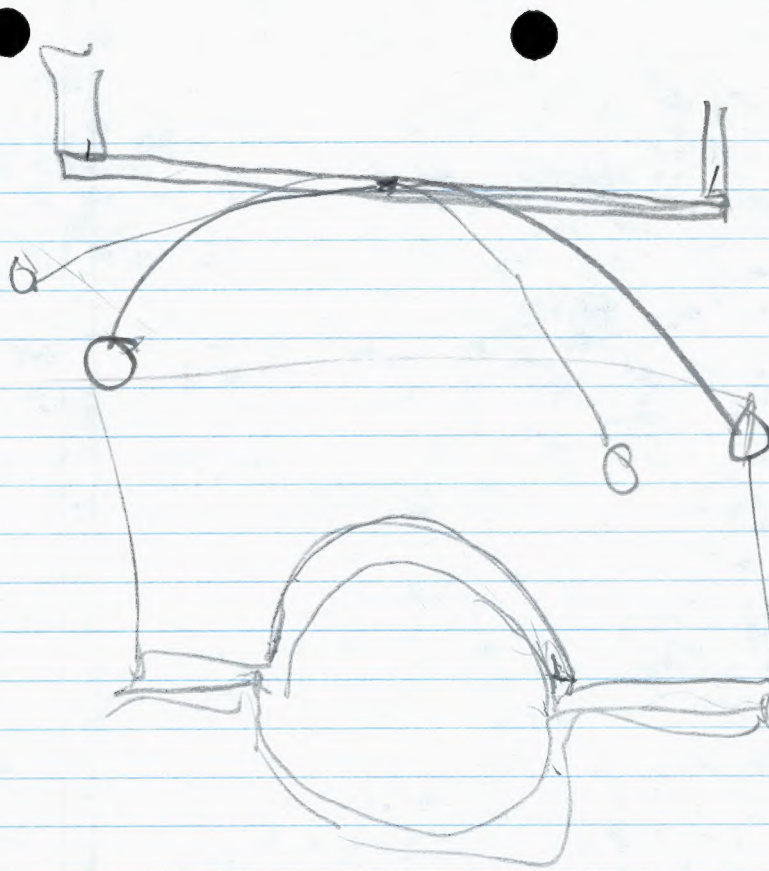
407 AFS FIG

$6\frac{3}{8}$ WIDE



$76\frac{3}{8}$
@ split





LONG RANGER

82 $\frac{1}{2}$

2 OF SKID TUBES

$\sim 82 \frac{3}{8}$

407 82 $\frac{1}{4}$

LONG RANGER IS $\sim \frac{1}{8}$ LONGER THAN 407

